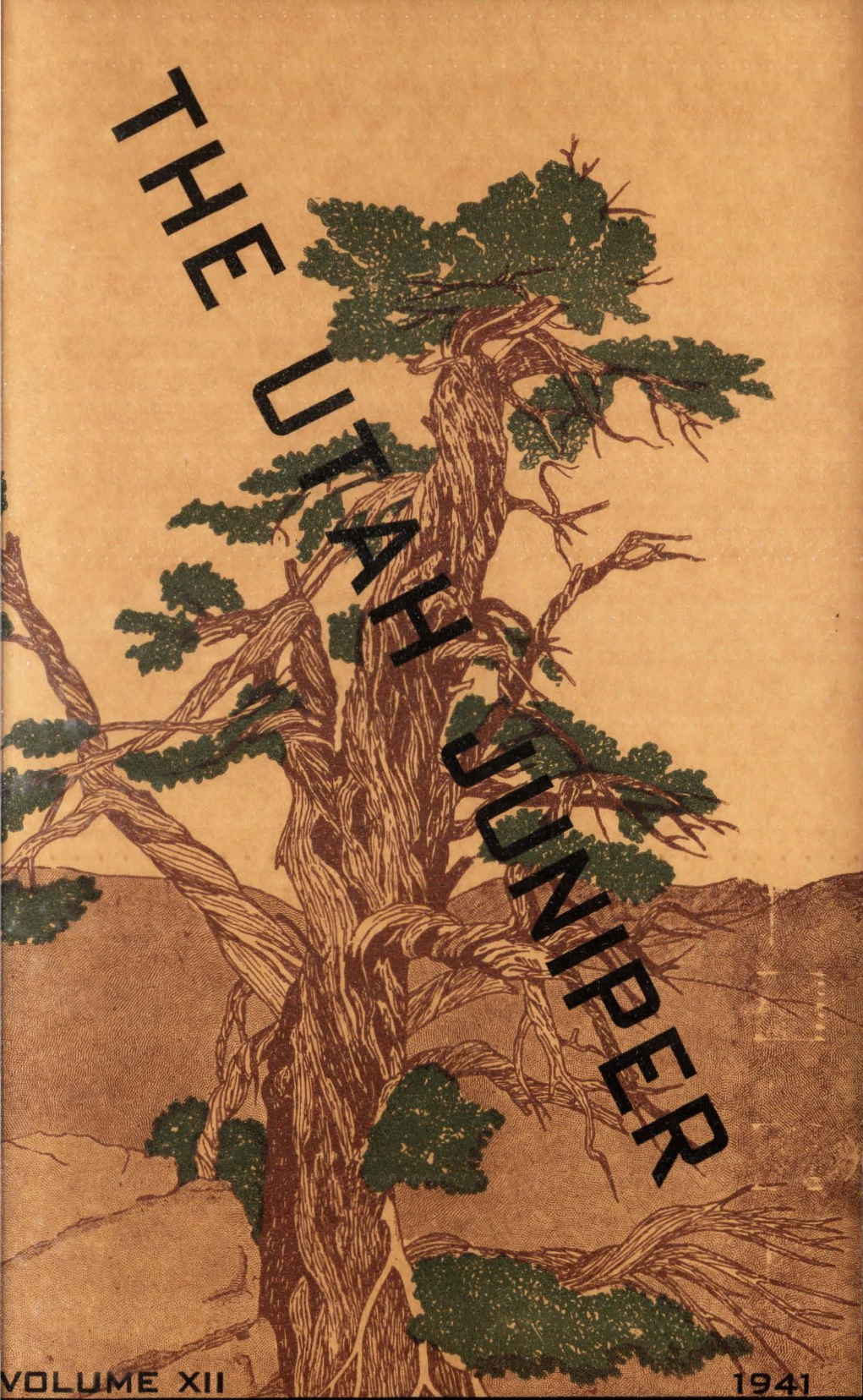
1941

# The Utah Juniper, Volume 12

Utah State University

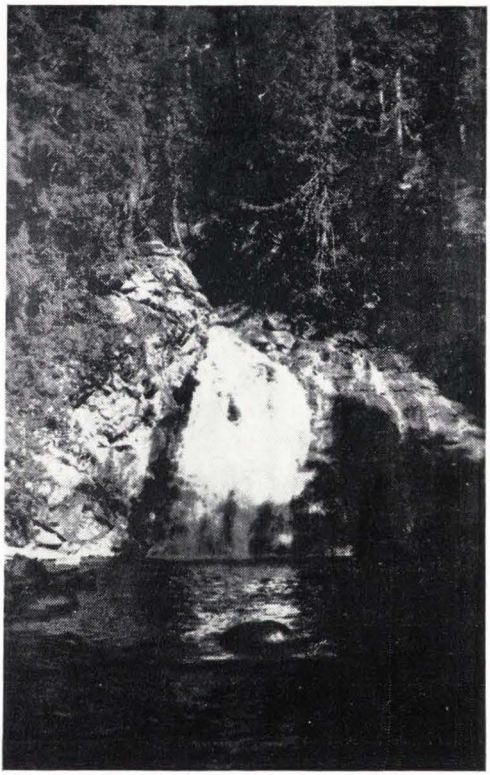
# THE UTAH JUNIPER



VOLUME XII

1941

# The
# UTAH JUNIPER



Annually Published
by
THE UTAH FORESTERS
Utah State Agricultural College
Logan, Utah

Volume XII 1941

# TABLE OF CONTENTS

# Dedication

Instead of dedicating this edition of "The Utah Juniper" to one individual, as is usually done, we, The Utah Foresters, wish to pay respect and admiration to all those young men in the field of range management who are consistently striving to penetrate the distant vistas of the unknown. Mere words cannot express our appreciation of these men who have deservedly earned the gratitude of all earnest followers of conservation.

# Range Problems of The Sagebrush - Grass Type

JOSEPH F. PECHANEC,
Associate Forest Ecologist, Intermounain Forest and Range Experiment Station, U. S. Forest Service, Ogden, Utah.

The sagebrush-grass type, third largest range type in the West, is one of the most important forage resources of the Intermountain Region.[1] So extensive is the type, 96 million acres in area with 50 to 55 million lying in the Intermountain Region, that it forms an integral part of nearly every range livestock operation. It is the chief source of spring and fall feed, a major source of summer feed, and in many localities furnishes winter feed for range livestock. As an indispensable seasonal link in the range livestock operation the maintenance or rehabilitation of the sage-brush-grass type is imperative to the welfare of the range livestock industry of the intermountain area.

With the exception of the true grass areas, the sagebrush-grass type is potentially the most productive of the range types. In its virgin state the type may have varied from a relatively open stand of sagebrush with a good understory of palatable perennial grasses and weeds to almost a completely pure stand of grasses and weeds.

But the sagebrush-grass type is also the range type on which depletion is the most severe. Only 2 percent of its present area is depleted less than 25 percent and 84 percent has lost over one-half its former grazing capacity. Accompanying this loss in grazing capacity, sagebrush has increased its density, and has in many sites almost totally replaced its former perennial grass and weed associates. This mass loss in grazing capacity and change in composition has come about through the combined action of faulty grazing management, drought, and the indiscriminate choice of the more productive segments of the type for dry farming. Many areas, broken for dry farming, were later abandoned and under subsequent constant grazing use failed to establish a good forage cover.

In its present condition the sagebrush-grass type presents many problems in rehabilitation and maintenance. Some of the problems are unique in that depletion has been accompanied by replacement where the two chief replacing species, sagebrush and downy brome, are serious barriers to range improvement. Sagebrush is a long-lived shrub, with a root system and habit of growth that is well adapted for competition with perennial grasses and weeds. For this reason it is extremely difficult for the grasses and weeds to "drive out" or "kill out" established stands of sagebrush except where the present sagebrush type has encroached on climax grassland areas.

Downy brome (cheatgrass), even though an annual, is extremely aggressive and a serious competitor for soil moisture. When present in dense stands it often prevents successful establishment of perennial grass seedlings.

In discussing the chief range research problems of the sagebrush-grass type, it may be convenient to classify the lands of this type into six groups, defining them by the present stage of depletion and the past practices that are responsible for their present condition. These groups are identified with the different measures that appear likely to be needed in their management or rehabilitation.

1. There are the sage-brush lands on which the original stand of perennial grasses and weeds remain essentially intact. If depletion has occurred, sagebrush has not increased to a sufficient extent to form a barrier to livestock movements

[1]Idaho south of Salmon river, Wyoming west of Continental Divide, Utah and Nevada.

or to improvement of the area by natural revegetation. Lands in this category are proportionately small in extent, and their comparatively simple problems are the determination of the most efficient methods of management and the proper degrees of stocking.

2. One of the two most important groups from the standpoint of extent is the sagebrush-grass range on which depletion has been severe. On this type of land the stand of perennial grasses has been decreased fully 50 percent, or more, and the stand of sagebrush has increased until it is definitely a barrier to range use or range rehabilitation. Recovery, even under the best types of management, is infinitely slow because the closed stand of sagebrush forms a barrier to increase in the abundance of the more desirable perennial grasses and weeds. Here the problem seems to be one of eradication of the sagebrush to permit more rapid natural revegetation by perennial grasses and weeds. Eradication must be accompanied and followed by sound management of the area to insure revegetation and to perpetuate the resultant stand of vegetation.

3. There are extensive areas of sagebrush-grass lands where depletion as result of injudicious grazing and burning has progressed to such an extent that even if the area was released from domination by sage an insufficient remnant of desirable perennial species remains to revegetate the area and prevent the return of the sagebrush. Lands of this category are second only in extent to lands of the preceding group. While the area is in the grip of the sagebrush, efforts at artificially revegetating the area must cope with the serious obstacles of getting seed properly planted and of the intense competition with sagebrush for moisture. Thus, it seems necessary to eradicate sagebrush, reseed to native or introduced grass and weed species, and devise systems of management for the area to be used during and following reestablishment of the forage stand. Without reseeding there is little use eradicating the sagebrush, and without subsequent management it is useless to eradicate the sagebrush or reseed.

4. Where promiscuous burning and overgrazing have almost completely killed out the perennial grass and weed cover, and most of the sagebrush cover, the areas are now clothed almost exclusively by annual grasses and weeds. With such a cover forage production and soil protection are extremely uncertain and natural revegetation to perennial grasses and weeds is exceedingly slow. Soil impoverishment may have accompanied forage cover reduction to a marked degree. Rehabilitation of this type seems exceedingly difficult because of the severe competition by downy brome, the soil impoverishment, and the difficulty of fire protection. Here the problem seems to be in establishing a perennial forage stand on the impoverished soils, using either introduced or native species, in the face of competition by the aggressive downy brome (cheatgrass). As with all of the other types of sagebrush-grass land the problem of management during and following successful reestablishement of the perennial forage stand must be considered. Often low land value and low potential production tend to discourage very expensive effort in revegetating these lands.

5. On sagebrush-grass areas that have been cultivated, later abandoned, and which have been revegetated by a dense stand of sagebrush the heavy stand of sagebrush offers a mechanical barrier to reseeding and severe competition for the perennial grass or weed seedlings. Sagebrush eradication, followed by reseeding with native or introduced perennial species and concurrent management seems to

be the necessary measure of revegetation. However, unlike the native range lands of the third group, these are potentially the most productive of the sagebrush-grass lands and thus warrant more expensive practices in their rehabilitation.

6. Some of the more recently abandoned farm lands are now clothed only by a dense stand of annual grasses and weeds. On these areas not to exceed a scattered stand of sagebrush has yet become established. In most cases downy brome is the chief annual species and few if any perennial grass or weed species are present. Artificial revegetation will be necessary on such areas, but it will be hampered by the heavy stand of downy brome. As with all other lands concurrent management must be incorporated into the program of revegetation.

The sagebrush-grass type, embracing these six groups, presents many problems in maintaining or improving the forage cover, problems that range research must solve. These many problems may be grouped under the categories of ecology of the sagebrush-grass type, grazing management, artificial revegetation, control and eradication, or replacement of undesirable or low-value species, handling livestock, and methods of measuring or studying native sagebrush-grass vegetation.

One of the very important group of sagebrush-grass range problems is that concerned with the ecology of the sagebrush-grass type. What are the processes and sequence of plant succession? What are the factors governing the distribution of the climax type? Where has the sagebrush type encroached on the Palouse bunch grass or shortgrass types? What is the rapidity with which abandoned lands will regain their virgin cover? What is the nature of the growth of sagebrush-grass range plants? What is the relation of plant growth, reproduction, and forage production to environment? Solution of such problems will enable the investigator to judge what may be attained by rehabilitation in the various sites and permit him to take advantage of nature to the fullest extent possible in devising methods for successful range improvement.

By all odds most important are problems connected with determining the most efficient methods of utilizing range forage and the most desirable grazing intensity both from the standpoint of sustained forage and maximum animal production. Not only must this problem be answered for those range types in better condition and which merely require satisfactory grazing management, but it is essential on every type of sagebrush-grass range. Where corrective measures are taken, whether it be reseeding, removal of sagebrush, or both, these measures will be of little avail unless incorporated with sound grazing management during and following the period of range improvement. Solution of specific problems such as the development of utilization standards for judging range use, nutritive value of sagebrush-grass range forages, proper season of use, most desirable systems of management, and proper degree of use will contribute directly to the solution of the problem of proper management.

Problems in the artificial revegetation of range lands include such specific items as the study of species adaptability; the development of more desirable strains or new species through plant selection and breeding; developing and testing machines or methods for the extensive reseeding of range lands; testing rate, time, and depth of seeding; developing adaptable mixtures of species to be used in range reseeding; and investigation of the use of nurse crops and other cultural methods such as the use of litter for promoting successful reseeding. In connection with the artificial

revegetation of range lands information concerning the site factors to be encountered in the various reseeding sites, growth requirements of different species to be used in the reseeding program, studies of soil deficiencies, and the degree of competition between reseeded and native species will provide much information essential for successful range reseeding.

Control and eradication of low value species presents problems centered around two plant species—big sagebrush and downy brome. What is the physiology of big sagebrush, and what measures may be used for its eradication? Paradoxically, almost nothing is known of the growth requirements and seeding habits of big sagebrush, even though it is one of our most common native western range plants. Such information is essential to the design of methods for its eradication whether by mowing, railing, flooding, or burning, and to the concurrent solution of methods of control.

Similar to big sagebrush, but little is known of the life history, growth requirements, and seeding habits of downy brome. Since it provides an uncertain forage source on several million acres of native sagebrush-grass range land, in many places to the almost total exclusion of other perennial grasses, its presence is a challenge to research. What is the life history of downy brome? What species could be used in reseeding that might successfully compete with downy brome? What cultural measures might aid in establishing perennial grass species? In essence, how may the present stands of downy brome be replaced by more stable stands of perennial grasses and weeds?

Such problems in handling range livestock as methods of conducting range lambing of sheep to prevent damage to the range, value of hauling water to range sheep and cattle, methods of controlling cattle distribution, and practices in handling sheep on trails to prevent poisonous plant losses, chiefly from bighead, are needful of solution.

Important, but contributing only indirectly to the solution of the main problems of the sagebrush-grass type, are such questions as the design of range experiments, methods of measuring production of range plants, methods of measuring grazing capacity, methods of determining percentage utilization, and methods of studying plant reaction to various degrees of defoliation. These are incidental studies but their study is vital to the solution of the main problems of the sage-brush grass type.

It is evident that range research is faced with a multitude of problems in devising methods for rehabilitating the forage cover on the sagebrush-grass ranges. A few of the major ones have been cited herein, but there are many others. Even though there appears to be a formidable lack of knowledge concerning the sagebrush-grass type, the extent and potential value of such lands as a link in the range livestock industry justify the immediate attack and early solution of their problems.

# RANGE PROBLEMS OF THE CANADIAN PLAINS

W. R. HANSON
Agricultural Assistant, Dominion Range Experiment Station.

Prior to 1912 beef cattle production on the open range was the chief industry of the prairie provinces of Canada. Grazing lands were considered to be inexhaustible and the extent of unfenced land avoided depletion of the range. Eventually the arrival of the dry land farmer and the sudden rise of wheat prices completely changed the picture. The view that all of the Canadian plains was suitable for crop raising and that ranching was a passing thing was adopted, with no thought given to the conservation of the native range land. Today some 3 or 4 million acres of abandoned farm land stand as a mute testimony of the fallacy of this view.

In Alberta and Saskatchewan there are about 25 million acres used as pasture lease or open range. Most of this land lies in areas where experience has demonstrated the land to be submarginal for grain growing under present conditions. At present the trend is toward a more wise and controlled use of such areas to avoid the catastrophe that followed a wholesale influx of small farmers into these areas in past decades.

Moisture limitations account for the larger part of the ranch lands falling within this category, but in addition there are tracts where the topography is too rough or stony for cultivation or the soil is too sandy. Most of southern Saskatchewan and southeastern Alberta receives an average annual precipitation of 15 inches or less with such low records as 6.38 inches having been recorded. Within this semi-arid plains area rise ranges of hills where the average annual precipitation may far exceed the average but the rough topography or soil conditions make it unsuitable for farming. The Cypress Hills, for instance, receive an average annual precipitation in excess of 20 inches in the higher parts but the terrain and the short frost-free period prohibit extensive crop growing. In the sand hills, even where moisture is moderate, the soil blows badly if the native sod is broken.

It is within this vast region stretching northward from the Montana border into Alberta and Saskatchewan that the range-livestock industry has retained its importance. Within this area the range problems of western Canada have become most acute.

It would be untrue to state that the ranchmen failed to recognize the arrival of range management problems that appeared with the fenced-lease era of ranching, for it appears that they realized the situation better than the heads of administration of lease lands. It is apparent that the administrators did not realize the limited carrying capacity of the area for regulations demanded that a rancher have at least one cow unit for every 20 acres of lease land. Ranchers were thereby forced to overgraze their range or to be dishonest in their herd count. A cry arose among the ranchmen for more land and a more equitable lease price. So insistent was the demand that a government survey was made of the situation. In order to correct the difficulties it was necessary to know the grazing capacity of the area and hence its productivity. The result was the establishment of the Dominion Range Experiment Station in southeastern Alberta in 1927.

Two major problems from the standpoint of range management presented themselves to the investigators at the station, (1) the rehabilitation of abandoned

lands and depleted pastures, and (2) the conservation of the native range.

Rehabilitation of abandoned land soon simmered down to a problem of reseeding to grass or other useful forage plants. The problem proved to be an interesting one but it is not to be discussed in this paper beyond mentioning that over a million acres of formerly weed-infested or drifting land now produce good yields of crested wheatgrass. Rehabilitation of depleted range requires many of the same methods as does their conservation and hence becomes part of the same problem.

The job of formulating a plan of conservation of the range resources of the Canadian plains is one that cannot be done overnight. Years of study of the basic factors of environment and their influences are necessary. A decade of research has produced enough information that progress is now being made. Twelve years' data from studies of the vegetation and its environment present some interesting pictures.

To understand the vegetational changes occuring in the area one must first gain a picture of climatic conditions. And henceforth in this paper I shall refer only to a large lop-sided semi-circle of territory with its diameter on the Montana border extending from the Sweet Grass Hills to Manitoba — exclusive of the high ranges of hills, (Shown in Fig. 1, page 11). The climate is marked by a relatively low precipitation, frequent winds, and abundant sunshine. Evaporation therefore is high. Loss of moisture by run-off is considerable, especially in the spring thaw. Fortunately, however, about 40 percent of the precipitation comes during April, May, and June. The season during which the temperature is high enough for plant growth extends, on an average, from late April to early October, but the actual growing season is often cut in the middle by drought during July and August. The severe climatic conditions are most intense near the center of this semi-circular area, i.e. around the point where the boundaries of Alberta, Saskatchewan and Montana meet. To the west, north and east, growth conditions generally improve until new vegetational and soil belts are reached.

The vegetation over this large tract is generally similar enough that it can be considered as an ecological unit. Plant life consists chiefly of hardy perennials which have extensive and finely divided root systems, those which make rapid growth during favorable conditions and set seed before the summer drought occurs, or in some other way resist the effects of drought. Some 600 species have been collected but on the typical open prairie the flora is rather simple and the abundant species are relatively few. There are but 6 principal grasses and sedges and not many more forbs and shrubs. In the following list the species occur in order of abundance.

**Bouteloua gracilis** (Michx.) Torr. — Blue grama grass.
**Stipa comata** Trin. and Rup. — common spear grass.
**Agropyron smithii** Rydb. — western wheatgrass.
**Koeleria cristata** Pers. — June grass.
**Poa secunda** Presl. — little bluegrass.
**Carex filifolia** Nutt. — nigger wool.
**Agropyron spp.** — wheatgrass.
**Calamagrostis montanensis** Scribn.
**Poa canbyi** (Scribn. ) Piper.
**Distichlis stricta** (Torr.) Rydb. — desert salt grass.

**Artemisia frigida** Weld — pasture sage.
**Eurotia lanata** (Pursh) Moe — silver sage.
**Atriplex nuttallii** S. Watts — salt sage.
**Phlox hoodii** Richards.
**Gutierrezia diversifolia** Greene — brown weed.
**Artemisia cana** Pursh — hoary sagebrush.
**Opuntia polyacantha** Haw. — prickly pear.
**Sphaeralcea coccinea** (Nutt. ) Rydb. — prairie mallow.

In addition to the plant cover mentioned another almost equal area is occupied by mats of **Selaginella densa** Rydb. (little clubmoss.)

The vegetative cover is rather scanty, occuping about 15 percent of the ground area, measured on basis of basal area. Grasses constitute most of the plant cover. The grass cover is made up of short grasses, chiefly **Bouteloua gracilis,** and mid grasses such as **Stipa comata, Agropyron smithii** and **Koeleria cristata.** The proportion of short and mid grasses varies with the locality and the intensity of grazing. However this brief description identifies the vegetative unit as part of the area to which Weaver refers as the "mixed prairie" association.

A study of the changes occurring within charted quadrats laid down upon native range grazed at various intensities gave some very interesting information, and some that is very pertinent to the problem of range conservation and proper grazing intensity. Quadrats were established inside of exclosures and on grazed pastures where the intensity of grazing varied from heavy grazing at 20 acres per head to conservative grazing at 40 acres per head.

Total plant cover underwent no important changes, and any that did occur seemed more closely correlated with climatic flutuations than with grazing practices. There were however, some distinct changes in the botanical composition, i.e. the proportion of the various species.

Consider the two species, **Bouteloua gracilis** and **Stipa comata.** The two species vary widely in their growth habits, **Bouteloua** being a short grass and **Stipa** a mid grass. The forage yield of **Stipa** per unit basal area was found to be 3 times that of **Bouteloua. Stipa** grows upright in small tufts, is easily grazed and does not stand trampling too well, while **Bouteloua** leafage is produced so near the ground that the entire leafage is not eaten and the tendency to mat gives it more resistance to trampling.

The calculation of the **Stipa-Bouteloua** ratio corroborated the general observation that grazing caused the mid grasses to disappear before the short grasses. The following observations were made under various intensities of grazing:

Complete protection — **Stipa-Bouteloua** ratio increased.

Grazed at 30 or acres per head — **Stipa-Bouteloua** ratio remained about constant.

Grazed at 20 acres per head — **Stipa-Bouteloua** ratio decreased.

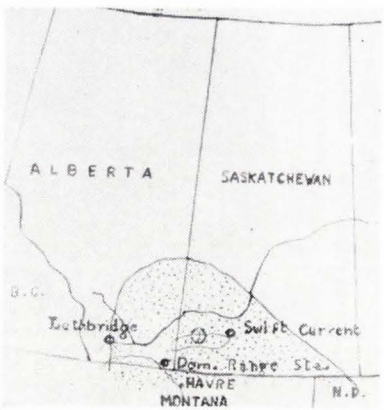
These results along with general observations suggest that the undisturbed climax is one in which the proportion of mid-grasses is much higher than found on the grazed range. and also that event under conservative grazing the proportion of mid grasses remains lower than in the climax stand.

The importance of these conclusions may be realized when one considers how they may be used to indicate that intensity of grazing which is best and, hence, to get at proper utilization. Let us assume that proper intensity of grazing is that by which the greatest sustained production may be had. The climax stand with its high proportion of the more productive grasses was found to have the highest potential productivity, but since evidence indicates that even moderate grazing reduces the proportion of mid grasses this level of production cannot be sustained. Therefore grazing to a sufficiently light intensity to maintain the climax is not economical. On the other hand a degree of intensity of grazing so great that the proportion of mid grasses progressively decreases and poorer species and weeds creep in, must lead to disaster. Somewhere between the two extremes must be the proper grazing intensity. This appears to be where the **Stipa-Bouteloua** ratio remains constant, i.e. where the mid grasses are able to compete and hold their own with the short grass.

This view is further strengthened by the fact that the potential productivity remained about constant in the fields where the **Stipa-Bouteloua** ratio remained constant. This occurred in fields grazed at 30 acres per head. Gains made by cattle were also quite satisfactory at this intensity.

The association between changes in botanical composition and range conservation should now be obvious. The crux of the conservation problem lies in proper utilization. If one knows the degree to which a given vegetative cover can be utilized without destroying it then he has a measuring stick to indicate where he must stop in order to conserve the vegetation and soil of his range. If he can make measurements and mathematical calculations to discover the proper grazing capacity he can then go to the individual species and measure degree of utilization.

The problem of conservation on the Canadian plains is chiefly one of moderate use. When the range investigator can indicate that point of use which will fully utilize the range resources without depleting it, he will have done a real service to the stockmen.




(Fig. 1.)

# SOME CHARACTERISTICS OF THE ANNUAL TYPE RANGE OF CENTRAL CALIFORNIA

J. R. BENTLEY
Associate Forest Ecologist, California
Forest and Range Experiment Station[1]

Annual type ranges differ in many important characteristics from the perennial types common on western range lands. Growth habits and growth requirements of the plants are distinctly different and annual forage is subject to sharper and more extreme fluctuations in composition and yield. Consequently many range problems of central California are quite distinct from those of the perennial types. It will be the purpose of this paper to point out some of the characteristics of the annual type for the benefit of those not acquainted with this kind of range. This discussion will apply particularly to the great central valley of California, the portion of the annual type with which the writer is most familiar.

The herbaceous cover on the valley and foothill ranges within this area is composed almost entirely of annuals, many of which are aggressive introduced species. Talbot, Biswell and Hormay in a discussion of the fluctuations in the annual vegetation of California (3) state that the herbaceous vegetation on some 25,000,000 acres of California range lands is dominated by annual plants. About half of this acreage is in the San Joaquin and Sacramento Valleys which together compose the great central valley. The remainder is in the Coast Ranges. Annual herbs cover the treeless valley plains and low rolling foothills, occur under the open stand of trees in the woodland zone, and make up the thin ground cover under the chaparral of the upper foothills. Annuals made up from 93 to 98 percent of the herbaceous cover on different kinds of range in the San Joaquin Valley in 1934. Fifty-four to 66 percent of the forage was made up of introduced species (3). Some of the most important introduced species include filaree (**Erodium** spp.), bur clover (**Medicago** spp.), soft chess (**Bromus mollis**), other annual bromes (**Bromus** spp.), and slender oat (**Avena barbata**). Important native annuals include **Trifolium** spp., **Festuca** spp., **Lotus** spp. and **Lupinus** spp.

Total precipitation, mainly rain, varies from less than 10 inches at the southern end of the valley floor to more than 40 inches in the upper foothills of the northern portion. It is distinctly seasonal, with peaks in the months from December to March and with practically none occurring between May and September. The annual plants which grow during the mild wet winters and mature seed before the advent of the long, hot dry season are very well adapted to these climatic conditions.

The proper season of use of the annual type is determined more by the requirements of the grazing animal than by the growth requirements of the plants, although soil conditions may limit too early use in some places. This contrasts with perennial types where at least the opening of the proper grazing season is governed largely by the stage of plant growth. In the annual type it is usually planned to put stock in the winter-spring pastures after new feed has made sufficient growth to carry the animals without material loss in weight. Ordinarily only a part of the forage is over 2 inches in height at this time and much of it is considerably lower. Some species have not yet germinated. This stage may be reached in November soon after seed germination but over much of the area the new feed ordinarily cannot be expected to carry stock before January or later. Low temperatures or insufficient moisture usually retard growth during the fall and winter.

[1]Maintained by the Forest Service, U. S. Department of Agriculture, at Berkeley, California, in cooperation with the University of California.

Annual range is essentially spring range. There is no shortage of range at this season as is common in western grazing areas. Annual plants grow rapidly at this time and provide an abundance of highly nutritious forage. They mature rapidly and dry completely sometime between April and July, depending on the year and the location, and for the remainder of the year are very poor feed. This is in contrast to some perennial types which dry slowly or only partially or cure well on the ground. A limited amount of nutritious summer forage is furnished by the burs of bur clover, by late-growing legumes such as **Lotus,** or by green vegetation in the low swale areas, but on most ranges this supply is quickly exhausted. Workers in this field (1) (2) have shown that the level of important food constituents, notably protein and vitamin A, decreases rapidly after the plants mature. The animal husbandmen have found that the dry feed provides a cheap source of energy if supplements are fed to furnish the deficient food elements. Consequently the length of the grazing season is determined by economic factors such as the type of livestock production and availability of other types of summer and fall ranges. It is a common practice to keep breeding herds on the annual type the year around or to reserve portions of it for late fall use after returning from mountain or other ranges. Supplemental feeding is advised for annual type ranges used in this manner.

Since the annual plants die each year it is not necessary to leave a portion of the leafage to safeguard storage of plant reserves, the common practice in perennial types, but ranchers have found it advisable to leave some old growth for protection of new plants and to safeguard the soil. The annuals have tenacious seeding habits and are able to produce seed under all except possibly the most extreme grazing. Also there is considerable carry-over in the ground of old viable seed of most species. But the effects of different intensities of grazing on the composition of the forage have not been measured. As far as the range alone is concerned the proper intensity of use may be the closest use consistent with adequate protection of the soil. But grazing should not be so close that the livestock suffer from lack of forage. More information is needed on the effect of different intensities of grazing on surface run-off and on the productivity of the soil.

A coordinated program of study on range problems is being carried on by several agencies at the San Joaquin Experimental Range, a branch of the California Forest and Range Experiment Station, located in the foothills of the San Joaquin Valley. Some of the most important investigations deal with the effect of different grazing intensities on the soil and forage and on the grazing animal.

Stocking of the annual ranges is complicated by the wide fluctuations in feed which are to be expected (3). Wide changes in species composition occur each year as slight differences in moisture or temperature favor different groups of plants. These species have different grazing values; consequently the variations affect forage values considerably. Volume of forage produced also shows greater fluctuation from year to year than occurs in the perennial types. An example of extreme fluctuation occurred in the southern end of the San Joaquin Valley between the drouth year of 1934 and the very favorable year of 1935. Over large areas the range hardly greened in 1934 while in 1935 there was a dense stand of tall annual forage. Changes in species composition are very marked and often rapid under complete exclusion from grazing. The accumulation of old material tends to shade out the more valuable low-growing broadleaved plants and grasses and favors the taller-growing grasses. This is considered to represent a decrease in forage values

and indicates that very light grazing may be detrimental to range forage values. The fluctuations are related to uncertanties in forage supply and soil cover and complicate range and watershed management.

Management of many perennial ranges aims at an increase in the original palatable species but this does not seem advisable on annual ranges. There is no way to determine how much of the original cover was made up of perennial grasses, but undoubtedly they were more common than at present and may have made up an important part of the forage over a considerable acreage. Now they furnish an insignificant portion of the feed. There is no indication that they can take over the ground from the aggressive native and introduced annuals under any kind of grazing. Many of the most valuable forage species are introduced and the grazing capacity may be higher than it was before their introduction. Some of the treeless ranges will carry 1 animal unit for 12 months on 10 acres under present management but the upper woodland areas below the dense chaparral require 20 to 30 acres. The best plan of management seems to be one that makes the most of the better introduced and native annuals.

There is, however, widespread interest in improving the annual range by artificial revegetation. The basic need is to increase the season during which ranges will furnish a balanced forage, although increased herbage production is also needed on some badly deteriorated ranges. Improvement can be made by finding species which cure better on the ground or species which provide green growth during the dry season. It may be possible to do this economically by increasing the range of some of the more valuable of the present annuals, by improving some of the present strains of annuals or perennials, or by introduction of new species.

There are many other characteristics and problems of the annual type but those discussed above are some of the most important. An attempt has been made to present a broad, general picture of the type to the readers not acquainted with it and to point out some of the ways in which it differs from many of the perennial types.

**Literature Cited**

1. Gordon, A. and A. W. Sampson
   1939. Composition of common California foothill plants as a factor in range mangement. Calif. Agri. Expt. Sta. Bul. 627.
2. Hart, G. H., H. R. Guilbert and H. Goss
   1932. Seasonal changes in the chemical composition of range forage and their relation to nutrition of animals. Calif. Agri. Expt. Sta. Bul. 543.
3. Talbot, M. W., H. H. Biswell and A. L. Hormay
   1939. Fluctuations in the annual vegetation of California. Ecology 20:394—402.

# SOME RANGE MANAGEMENT PROBLEMS OF THE NORTHERN GREAT PLAINS

FLOYD LARSON
Area Range Conservationist, Soil Conservation Service, Billings, Montana

We hear much about "The Plow That Broke the Plains," but visit any of the legions of abandoned homesteads and see for yourself the Plains that Broke the Plow. Wave after wave of farmers tried to subjugate the Plains, but the grass still waves over most of this domain. Our drought experiences of the last decade have shown us that not only is livestock-raising here to stay as a major means of livelihood but also that this business must be depended upon as the backbone of the plains economy.

Such an important business is worthy of receiving assistance from research institutions, and the Federal government and the States have recognized this need and made provision for it. Range research work began about 1900. Nine Federal agencies, the state agricultural experiment stations in each of the seventeen western states, the thirteen colleges and universities that offer detailed work in grazing, and several important privately-financed institutions have engaged in range investigational activities. However, the statement has been made that "range research started about a quarter of a century too late, and has never been on a scale commensurate with requirements." "Studies undertaken to date have covered a rather wide scope and have contributed highly useful data; but actually they represent a thorough-going attack only on a small fraction of urgent vexing questions that constantly arise to plague the stockman and land administrator" (1).

The Western Range, Senate Document No. 199, (1) lists three major lines of investigation needed in the field of fundamental range research: "(1) The palatability and nutrition value of each of the plants which compose the range forage; (2) the life histories and ecological relationships of all forage plants and associations; and (3) the ecological and physiological reaction of all plants to livestock use." To the first of these we should like to add that we need to know the growth forms of plants and their relative volume production from year to year. To the third we should like to add that we need much more information regarding the ecological and physiological reaction of all plants to drought, and information concerning combined effects of drought and grazing on plants. Fundamental research of this kind yields the basic information needed in attacking almost all of the western range problems.

A number of experiment stations in the Great Plains have been making worthy contributions to improvement of grazing practices and livestock management. However, much remains to be done.

**Grazing Capacity.** Much more work needs to be done in determining proper grazing intensities. The basic guidance for this work must come from carefully controlled grazing studies at the experiment stations. The several excellent studies now available are only a beginning when one considers the great diversity of vegtative types and local climates that make up the western range domain. Each of these major types in each climatic locality should have a grazing study to determine the point of proper grazing intensity. And when we say proper grazing intensity we are thinking particularly of that point where conservation of the range resources and maximum production of low-cost livestock products come into balance. Only careful grazing trials can determine that point.

**Feed Requirements of Livestock on the Range.** While information on a feed-lot basis is available to show the relative feed-requirements of livestock at various ages, we lack sufficient information of this kind for livestock on the range. The added factor of trampling, as well as other factors, no doubt changes ratios on the range considerably from those in the feed-lot. Just what is the correct conversion figure between cattle and sheep and how much should this figure change from grass range to browse or weed range? What is the feed-requirement of a mature cow (animal unit) to calves, yearlings and other classes of stock? No doubt feed-requirement relationships are affected by a number of factors, such as types of forage, season of use and topography. As we perfect our grazing capacity information we must also come to a finer adjustment in our conversion factors between different kinds and ages of livestock.

**Range Plant Breeding.** The past decade has seen a pronounced increase in range plant breeding work. The next decade will probably bear the fruits of this work, some of which are already appearing. Here is a more leafy strain of crested wheatgrass. There is a strain of buffalo grass with better reproductive characteristics. Improved strains of grasses means more productive ranges, and this helps to solve one of our biggest range management problems; namely, how to practice conservation on our range lands and still make them yield enough to pay the high taxes imposed.

A promising field for further study is that of improving forage yields on wet bottom lands with heavy soils and poor drainage. While these areas are not extensive from the standpoint of acreage, they are nevertheless, very important because of their high forage-potential. One acre of such subirrigated bottom may produce more than one hundred acres of poor range land. Furthermore, drinking water is usually more easily obtained for livestock on such areas, and they are oftentimes the dependable forage-producing part of the ranch, since they constitute the winter-grazing of winter feed source. However, under irrigation these fertile bottoms often become impregnated with alkali and then the valuable hay and forage species largely disappear and are replaced by tough, unpalatable grasses and weeds. We are just on the threshold of range plant-breeding development, and no doubt some better forage species for heavy bottom lands can be developed. Strawberry clover is giving great promise on subirrigated lands. Western wheatgrass, quack-grass, and other grasses, sedges and clovers give us a good starting point for developing alkali-tolerant species of good forage value.

**Range Survey Methods.** Continuing research needs to be carried on in perfecting range survey methods. Ways of reckoning with the volume factor, especially, require more thought and attention. This in turn requires more data on volume production of all major range species under all different site conditions and over a long enough period of years to span all climatic variations that occur from year to year.

Proper use (palatability) values of individual forage species are in need of further scientific check and corroboration. Our knowledge is incomplete regarding such important items as seasonal palatabilities, seasonal movement of nutrients through the plant and their storage, effect of weathering on loss of nutrients, and the actual meat-producing value of different forage species. Studies whereby a number of species are planted in replicated plots and a series of these plots subjected to selective grazing by livestock at different stages during the growing season are giving useful information on seasonal palatabilities. Such information is of great value to range administrators.

**Utilization Studies.** The research stations are to be commended for their originality and ingenuity in devising methods of determining the degree of range utilization. Still "one encounters a widespread need for simple, usable measuring sticks of range conditions" (1). The problem has been attacked from several different angles, and at present several different methods are in use. Further work will bring out the advantages and disadvantages of these methods. We will probably find that a different method is needed for intensive studies from that recommended for extensive work. Increasing basic investigations will give us more information about the forage plants and what constitutes proper use of them over the wide range of fluctuation in forage production from year to year.

More educational activity can stem from the research stations to bring home to the stockmen a true appreciation of the losses many of them are sustaining through haphazard grazing practices which cause overgrazing on certain areas near water and leave the forage on other areas virtually untouched. Many stockmen, having accepted carrying-capacities recommended by governmental agencies, have failed fully to appreciate that they may overgraze and injure portions of their range by spotty utilization of forage.

**Overgrazing Indicators.** At one time exploitation of national resources went on unchecked, and when the Government undertook to put a stop to such wastage it was necessary among other things to show the stockmen the false economy of overgrazing. Now, however, the principle of conservation has been accepted by the people. This is an opportune time to teach stockmen to recognize and use plant indicators. Help them learn to recognize the overgrazing indicators — cactus, annual weeds, gumweed, snake weed. Help them to learn to watch their own pastures, for the first sign of deterioration. The research stations can help amass more and better information on overgrazing indicators and put it in a form in which it will quickly reach the public.

**Supplements to Feed with Winter Grass.** Grass — summer or winter — is the cheapest feed obtainable. We can probably seldom get along without feeding some hay to weak stock during stormy periods in the winter, but the hay-feeding should be held at a minimum because it is expensive. Regardless of how cheap the land is on which the hay was raised, just the labor involved in harvesting and feeding it makes it more expensive than grass. If hay is fed on the range there is usually considerable waste, and if it is fed in the feed yard the stock do not forage for themselves as well. We need more studies on nutrient and vitamin deficiencies of field-cured grasses. Following this should come studies of preparing concentrated feeds to supply these deficiencies. In preparing these concentrates, the emphasis should be on using local low-priced feeds prepared as cakes or pellets so that they can be easily transported and fed on the open range without waste. Who knows but that weak stock in winter fed a little of such a balancing concentrate before they get in poor condition might soon be out rustling again without serious expense or loss to the operator?

**Animal Factors.** It is very important that we learn more about wildlife relationships and especially about the mooted question of the "balance of nature." Do some rodents in their influence on soil development do more good than harm? When we kill off the prairie dogs do we increase coyote depredations on sheep, and if so, which is the lesser of two evils? How much do livestock and antelope compete for the same forage? What can we do at our thousands of small stock-water reservoirs to give them maximum value to game animals, birds, and fish?

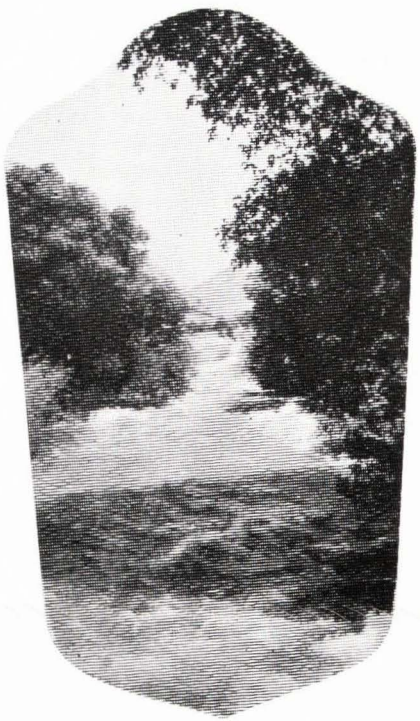
What can we do in management of our range lands to help keep down the damaging infestations of grasshoppers and insect pests that plague our agriculture? Some good information is available on these and similar questions, but the unexplored portion of this field is still large.

**Moisture Retention Studies.** Big contour furrows, wide-spaced, have proved ineffective in the northern Plains so far as improvement of the forage crop is concerned. We have already turned to small furrows, closer together. How small and how close such furrows should be for various relationships of soil type, climate and slope is a problem that needs more attention and help from the research stations.

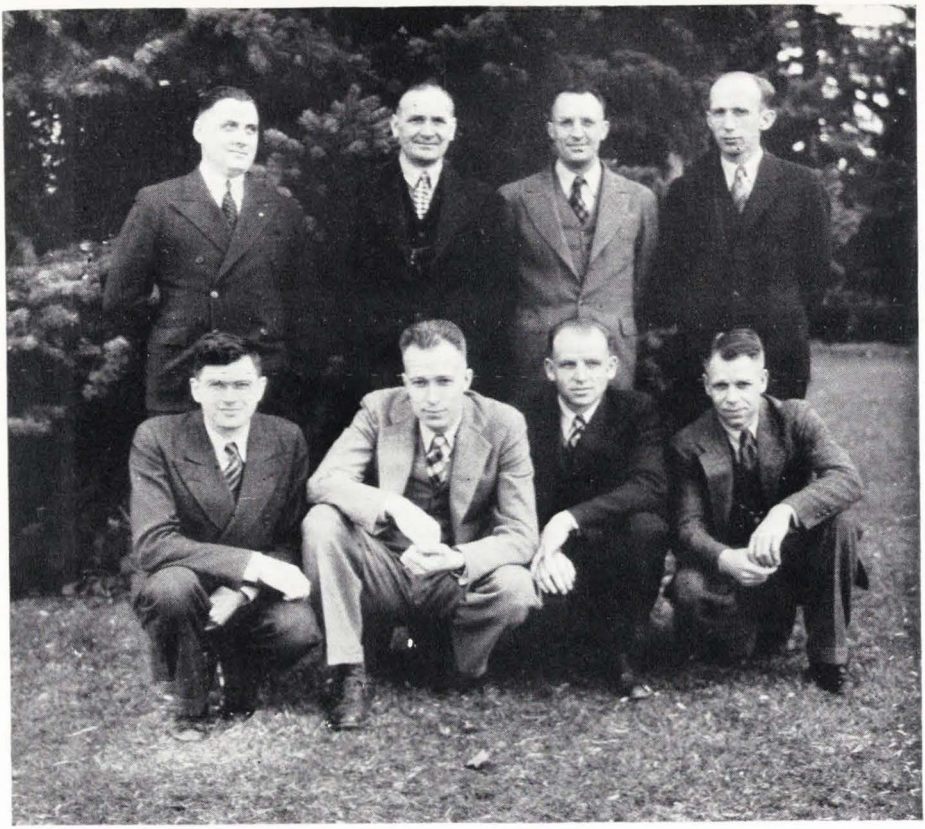
The foregoing pages have indicated some of the more important range management problems of the northern Great Plains. Space does not permit discussion of others, such as the poison weed problem, diseases, the economic problems, etc. The problems are many — probably greater than the immediate facilities to attack all of them. In view of this situation, administrators and research directors should sit at the conference table and outline a program and priority list of research projects so that the more important problems can be attacked first. In addition, all possibilities of adapting certain phases of administrative work to the objective of obtaincertain research data should be thoroughly examined and siezed upon. And lastly, range men in the field everywhere should be ever observant and should keep records of their work so that the vast mass of everyday experience can be marshalled to help solve our range management problems.

**Literature Cited**

1. The Western Range, Senate Doc. No. 199, 1936.



# Organizations



# Faculty

**Dean Paul M. Dunn** Faculty advisor to the Deans Team. Any student with less than a 3.2 average has made his acquaintance. Dean of Forestry. Diplomat supreme and job-getter par excellence.

**Dr. Robert Penfield McLaughlin** Went to Yale. "Doc" is known to all of us far and wide. Big Chief of the Forestry elimination contest held each summer at Tony Grove—Sophomores beware!

**Arthur D. Smith** Initial very pert'nent. All foresters beware. Range students wish somebody would marry him off. Between conscription and Art's grades the forestry building should be a lonesome place next year.

**George H. Barnes** Acts dumb with smart students until they feel as dumb as he is smart. Students are surprised to find out just how much he really knows. A great teacher — all foresters agree.

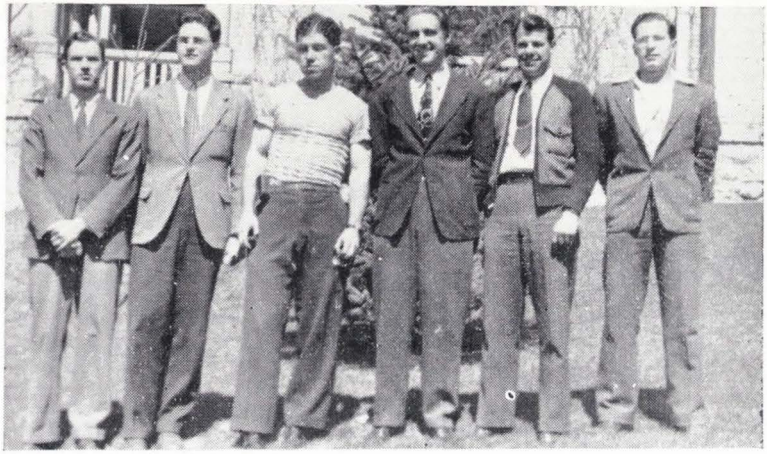
**Dr. Laurence A. Stoddart** Dont let that "A" fool you — you'll never see one on your grade card. "Doc" keeps the range students guessing so they won't have to do it on the Civil Service exams.

**J. Whitney Floyd** The Extension Forester. Talks to farmers until they believe trees are more important than cows. Then he convinces the cows.

**George H. Kelker** Head of the Wildlife Department but his secret ambition is to flunk Einstein in a math class. If his formulas say there are 82.4 deer on an area, the only way to convince him there are but 81.4 is to shoot one and donate the skull to the Wildlife Department.

**Dr. D. I. Rasmussen** The other wildlifer who shot the deer mentioned above. Quite a traveler. Always in demand by the wildlifers. Seen seldom, heard of often.

**Dr. Stillman Wright** Occupied with studies at Bear and Fish Lakes. Aquatic biologist, knows the habitats of the mermaids.



Grant Williams, Wm. Rozynek, B. C. Smith, John Bernhard, Horace Jensen, Bert Newman. Absent: Professor Smith.

# Utah Juniper Staff

EDITOR ..... JOHN BERNHARD
ASSOCIATE EDITOR ..... LLOYD RAMELLI
FACULTY ADVISOR ..... PROFESSOR SMITH
BUSINESS MANAGER ..... HORACE JENSEN
ASSISTANT BUSINESS MANAGER ..... GRANT WILLIAMS
PHOTOGRAPHER ..... B. C. SMITH

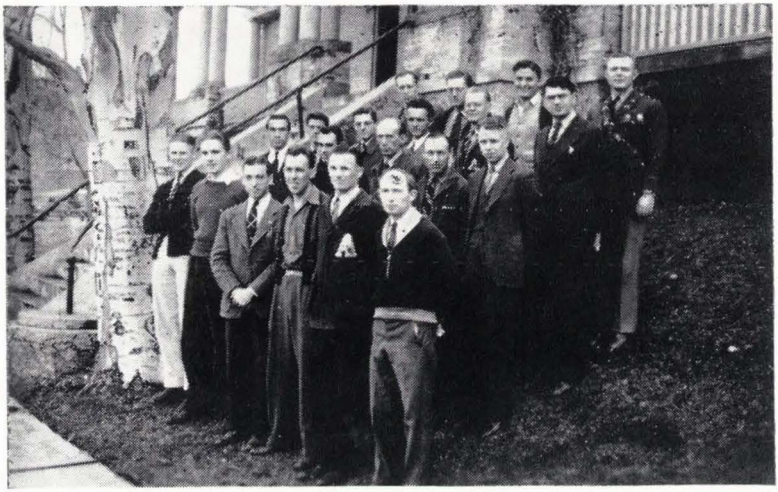
Lloyd Ramelli
"The Little Man
That Wasn't There"

**WRITERS**

DEAN PAUL M. DUNN
VICTOR RUDOLPH
REX HAMPTON
BERT NEWMAN
BILL ROZYNEK
JOHN HALL
ELMER COX
ED O'NEIL
ED LOFTHOUSE

The Utah Foresters

The Utah Foresters



First row: Harold Hiner, John Bernhard, Ward Stevens, Edwin Lofthouse, Victor Rudolph, James Gatherum. Second row: Joseph Nemanic, Luther Bergen, Dr. D. I. Rasmussen, Nolan West, Prof. George Barnes. Third row: John Killough, Kenneth Hampton, Elmer Cox, Reuel Janson, Prof. George Kelker. Fourth row: Dr. L. A. Stoddart, Everett Doman, Rex Hampton, Harry Woodward.

## Xi Sigma Pi

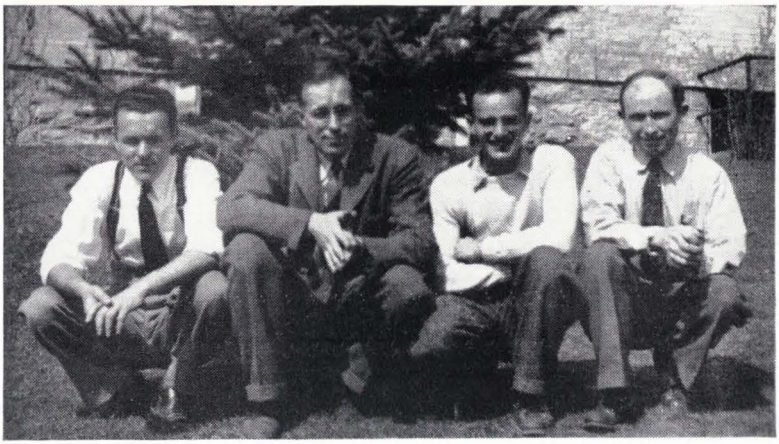
Now in its second year of existence, Lambda Chapter of Xi Sigma Pi, national forestry honorary fraternity, is fulfilling the aims and ideals of its founders and of the members here at Utah State. The installation of Lamba chapter April 27, 1940, brought about the realization of one of the ambitions of the founders of its predecessor. Phi Gamma Rho, who, with members of the faculty, had worked untiringly to obtain this affiliation.

Lambda Chapter has continued to carry on the projects and traditions of Phi Gamma Rho by incorporating them with those of Xi Sigma Pi. One of these is the observance of Arbor Day by planting new species of trees on the campus, adding to the already wide variety now found here. This year a Paper Birch and a Yellow Poplar were planted.

Xi Sigma Pi was founded at Washington University, November 24, 1908. Until 1915 it remained a local chapter, then under a new constitution a second chapter was established at the Michigan State Agricultural College. Other chapters soon were added until at present there are fourteen throughout the nation from Maine to California.

The objects of the fraternity are to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of forestry, and to promote fraternal relations among earnest workers engaged in forest activities.

The fraternity stands for clean scholarship and its members, both individually and collectively, encourage forestry activities at the institutions with which they are connected through active participation in the projects of their respective forestry clubs, and by encouraging the development of leadership in school activities.



Elmer Cox, Professor L. A. Stoddart, Nathan Lipman, James Gatherum.

# Chips Staff

## "CHIPS"

With the cooperation of the School of Forestry and the Utah Foresters, CHIPS, in retrospect, has enjoyed a second successful year. It has become an indispensible medium in creating better spirit and understanding between the faculty and the students.

Our contributors have been many and varied, and to them CHIPS extends its thanks for the promotion of a better news-sheet. Probably the most consistent and conscientious contributors have been the forestry faculty members. From interesting phases of extension forestry written by Professor Whit Floyd to aquatic articles by Dr. Stillman Wright, the faculty has supplied CHIPS with valuable information covering all points of conservation. Students have contributed more than ever before; not one student declining the offer to write his bit whenever asked.

Bob Corey was the incumbent editor at the beginning of the year, and carried on efficiently until the new editors, Jim Gatherum and Elmer Cox, became more experienced in the journalistic art. Simon Baker, able junior student, is a recent addition to the staff, and has proven his worth already.

A valuable man on the staff was Nathan "Bud" Lipman, staff artist, who kept the mastheads of CHIPS varied and interesting, always providing an appropriate sketch. We appreciate his fine and unselfish efforts.

Dr. L. A. Stoddart, our helpful faculty advisor, has become as indispensible to CHIPS as the masthead itself. His advice and suggestions have been very welcome to the staff. We sincerely hope for his continued generosity and support.

Dean Dunn's secretaries, Mrs. Buelher and Miss Olson, also are very important reasons for the success of CHIPS. They alone are responsible for the remarkable lack of typographical and grammatical errors appearing in CHIPS.

With the cooperation of the School of Forestry and the club, CHIPS looks forward to another greater and more successful year of journalistic ventures.

# *Functions*

# A.W.F.C. Palaver

The Third Annual conclave of the "Association of Western Forestry Clubs" burst forth into full swing on Thursday, February 13. Those delegates who were fortunate enough to attend the conclave will probably remember it for a long time to come as one of the most outstanding, colorful events in their lives. Delegates were present from the University of Montana, University of Idaho—Southern Branch, Colorado State College, University of Idaho, Iowa State College, Oregon State College, Washington State College and our own Utah State.

President Elmer G. Peterson, and Dean Paul M. Dunn extended hearty welcomes to the delegates as the first session got under way. Discussion of the proposed formation of "Student Chapters of the Society of American Foresters" in the place of the "Association of Western Forestry Clubs," was the order of the day.

The second session, which was held in the early afternoon of the same day, was for the purpose of appointing the several committees, and giving each committee its assignment, from the conclave docket.

The day was finally brought to a close by attendance at the Fourteenth Annual Foresters Banquet, which was held in the cafeteria of the Commons building. Mr. Clepper, the Executive Secretary of the Society of American Foresters, was the guest speaker of the evening. Mr. Clepper made the trip from Washington, D.C. to be present at the conclave and to offer his assistance in the proceedings when necessary.

On Friday morning, the third session of the conclave saw an enlivened bunch of men, all acquainted now, ready for serious business. Many of the most important subjects before the delegates were brought to light and passed upon. During the course of the meeting, it was resolved that:

1. The name, "Association of Western Forestry Clubs" should be changed to the "Student Chapters of the Society of American Foresters."
2. An amendment to article three of the "Student Chapters" constitution

should read: "Membership in the Student Chapters shall be on the basis of forestry clubs having active membership in schools in the United States and Canada, giving professional training in forestry."

3. More publicity shall henceforth be given to the organization if it is to become a nation wide organization.

In order to accomplish this last proposal, the initiative must be taken by Iowa State. It was suggested that Iowa State call a conclave next year for the schools in the middle west, and if possible, bring into the conclave a far-eastern school, such as Pennsylvania.

Throughout the meeting, Mr. Clepper was an interested listener as well as an eloquent speaker. It was his aim not to interfere in the proceedings of the delegates, but when called upon, he passed on to the conclave some very intelligent and helpful information. Mr. Clepper has definitely proven that he is behind the "Student Chapters," and is giving them his utmost cooperation.

After the business for the day had been taken care of, the delegates put away their notes and pencils and took a short trip to the deer feeding grounds. About nine o'clock, the delegates picked up their lovely "dates," and spent the remainder of the day, and the early part of the next at "Paul's Party."

Saturday's session of the conclave was attended by tired, but still enthusiastic delegates. Along with the serious business of the day, the delegates slipped in a bit of humor here and there.

During the course of this, the fourth and last meeting of the conclave, it was resolved that:

1. Utah State should act as the publicity director of the "Student Chapters" for the ensuing year.
2. There should be more inter-club competition, such as the rifle team matches.
3. Next year, 1942, the University of Idaho, and Washington State College, will jointly sponsor the 1942 conclave at the University of Idaho at Moscow.

When all other matters of importance had been taken care of, a delegate from each school read a report on the events at his respective schools, presenting material of interest, and value to the other schools present. In one of the reports, it was suggested that each school build, if possible, a club outing cabin. Oregon State suggested that each school start a "Press Radio Guild" or some other activity as this in some allied line.

The delegates were a wide awake, cooperative, congenial group of fellows to work with, and much credit must be given to our own inimitable Harold Hiner who, as chairman, presided over the conclave.

The Xi Sigma Pi Banquet, held Saturday evening, was a fitting close to a most successful conclave, and when at last the delegates had eaten their fill of steak, a weary but happy party of fellows started wending their way home."

# IN MEMORIAM

## KARL J. WILKINSON

Karl J. Wilkinson, Range graduate of 1937, was killed in a snowslide near Jarbridge, Nevada, February 28, 1941, while conducting a snow survey, part of his duties as Forest Ranger.

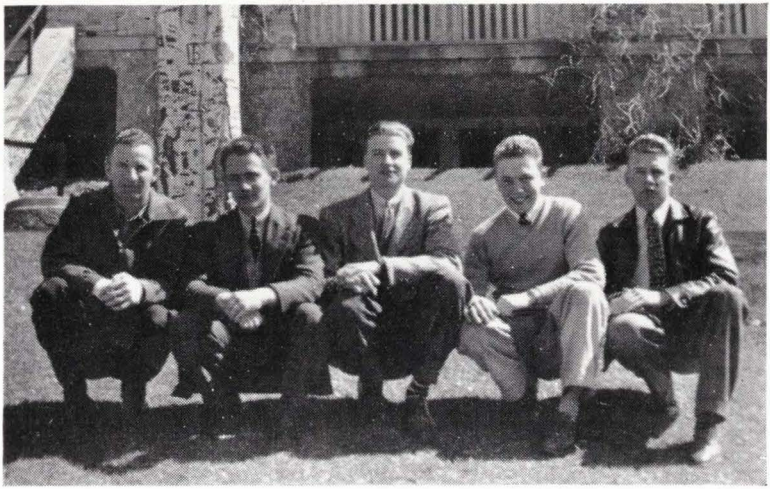
While in school, Karl identified himself as an exceptional student, being affiliated with those scholastic honor societies to which he was eligible. He was capable, ambitious and resolute, discharging his duties with precision and skill. We who could count him as a friend held him in high esteem.

Regretfully we take this opportunity to pay him tribute.

* * * *

Yet not to thine eternal resting place
Shalt thou retire alone — Nor coulds't thou wish
Couch more magnificent. Thou shalt lie down
With patriarchs of the infant world—with kings,
The powerful of the earth—The wise, the good,
Fair forms, and hoary seers of ages past,
All in one mighty sepulcher.—Bryant.


1. Winning "Shrubbery" float at Homecoming. 2 Ole personality Vic with two conclavers. 3. The "gang" at the Bunyan Party. 4. Tight fit, Dean? 5. Theme-song of this publication. 6. Yep, sonny, you're in this too! 7. Oops, Dean, and so serious! 8. Grand Gladiators of 1941 — Graduates, for short.



CLUB COUNCIL

Victor Rudolph, Robert Branges, Bryce Albertson, Robert Corey, William Mathews.
Absent: Lawrence Colton, David Latimer.

## "Ye Olde Clubbe"

Once more another year has gone by for the Utah Foresters. In retrospect, the majority of the activities of the club have been very successful, with at least some measure of success having been achieved in all projects undertaken.

This was the second year in which a council functioned as the governing body of the club. Council members were the club officers: Victor Rudolph, President; David Latimer, Vice-president; Robert Corey, Secretary-treasurer; and Larry Colton, William Mathews, Robert Branges and Bryce Albertson as Senior, Junior Sophomore and Freshman Class Representatives, respectively. The position of faculty advisor was capably filled by Professor J. Whitney Floyd.

The Fall Barbecue started the ball rolling for the club the first week of school in October. Steaks, cider, rolls and apples galore, plus spirited competition between classes, faculty and visiting rangers filled in a very enjoyable afternoon. At the annual Alumni Homecoming parade the Foresters' float copped top honors as being the most original. The following month a joint meeting with our arch rivals, the Engineers, was held, during which friendly contests waxed hot for points towards winning the coveted "Little Brown Jug." Due to the generosity of the Foresters, the Engineers were successful in winning the trophy by a very close margin.

At the annual Home and Harvest Festival all Foresters pooled their cooperative efforts, with the result that of four first places for exhibits, three were awarded to the indomitable axemen. Just to round out the occasion, Helen Wright, the Foresters' nominee, was elected queen of the festival.

(Continued on Page 38)

# Bunyanites Blowout

In keeping with the annual week of Foresters' Delight and the engineers' incapacity, the Utah Foresters proudly donned the garb of the Bunyanites and proceded to carry on with the customary diversion from more relevant concern.

Guests of honor during this regal week were the representatives to the annual conclave of the Associated Western Forestry Clubs to whom the Utah Foresters acted as hosts.

The conclave and Foresters' week were officially opened with a club meeting of the Foresters on the evening of February 12 with Victor Rudolph, president of the club in charge. After a short program and pep rally the delegates and Foresters adjourned to attend the play, "Valley Forge," presented by the college Little Theater. With the evening's entertainment over, the delegates and Foresters alike retired to await the events of the morrow. However, as evidenced by the signs of general decorative talent displayed about the engineer's building the next day, all Foresters had not been safely tucked into bed as had been prescribed.

Bright and early on the following morning activities began and from then on until the end of the week the campus fairly hummed with excitement. First of all, a goodly portion of the Bunyanites under Editors John Bernhard and Lloyd Ramelli were occupied with the task of keeping the Foresters' edition of "Student Life" safe from the hands of the unappreciative engineers.

"Student Life," as was the rest of the campus, was blitzkrieged and taken over for its own protection for the duration of the week. This assimilation had a twofold purpose, first it gave the Foresters an opportunity to properly expose their uncouth arch enemies, the engineers, and secondly, it presented the newspaper world with an array of talent as has never before nor since been equalled. There was little difficulty experienced from the feeble attempts at sabotage by the engineers as their punitive uprisings were gently (?) curbed and the literary masterpiece delivered as scheduled to the awaiting knowledge-hungry student body.

This day was climaxed by the 14th annual Foresters banquet held at the College Cafeteria. In addition to the address by Mr. Clepper, remarks were made by the various members of the U. S. Forest Service and other conservation agencies and by the various delegates. Professor Arthur D. Smith acted as toastmaster.

Again the nocturnal instincts seemed to surge forth, only on this memorable night engineers as well as Foresters went forth to explore and plunder. After the smoke had cleared some fifteen engineers were seen beating a hasty retreat from the Forestry building, thoroughly discouraged and, of all things, minus their pants. The outnumbered, yet triumphant Foresters had proved themselves kings of the week in their own right.

Friday found the "conclavers" and the remainder of the student body in feverish excitement. However, aside from a successful storming and capture of the engineering building all remained calm and serene until the Student Body assembly. This assembly was directed by a committee known as the Silent Three — Fred Imhoff, Lisle Green, and James O'Toole — and through their untiring efforts the Foresters presented the delegates and the student body with such a superb hour of entertainment that even the Foresters were surprised, not to mention the bewilderment of the engineers. The assembly was uniquely closed by presenting the engi-

neers with a string of trophies in the form of pants they had parted with the night before in their brash and vain raid on the Forestry building.

The assembly past, Paul's Party, in the form of a semi-formal dance, was held at the Dansante. The party may be briefly and adequately described as being the same superior campus social of the year that it has always been.

Saturday morning was given over to those taking the Student Aid examinations. After this ordeal the delegates became the guests of the Xi Sigma Pi fraternity at a venison dinner served at the School of Forestry Summer Camp at Tony Grove. Here the guests were royally entertained, the notorious "Arthur D. Smith Trophy" was bestowed and the conclave and Foresters Week brought to a close.

## Forestry Calisthenics

As another intramural year draws to a close, a summation of the year's events again finds the Foresters in first place. The outcome is still in doubt, with two events left to play — softball and tennis — but our men in green have a 74 point lead to protect and it looks as though the annual intramural banquet will again find the Foresters receiving the Department League Trophy.

After a slow start in touch football and "A" basketball last Fall, the Bunyanites climbed to the top in wrestling, the only other Fall competition. A third place in touch football, a fourth in "A" basketball, and a first in wrestling left the Foresters the second niche in the League, 90 points behind the Ag Club.

In the Winter quarter, however, our teams dominated the events, placing second in the intramural Open House among all the teams entered, and first in the Department League. Our beautifully decorated booth won an excellent rating .The club scored another triumph here by successfully electing Rae Scott, our candidate for Open House Queen. To this, in rapid succession, were added a championship in swimming, top honors in volley-ball, and the prize of all prizes, the grand championship of the annual Winter Carnival. The end of Winter quarter found the Foresters in first place with an 123 point lead over our close rivals, the Ag Club.

As this goes to press, our lead has been cut down by an Ag Club victory in the track meet, but with a spirited softball team and several promising tennis prospects, it looks as though the Foresters are a "sure thing" for Champions of 1941 — cross our fingers and hope to die!

Foresters at Winter Carnival

E. Boyle, B. Rozynek, R. Hampton, Bud Lippman, K. Hampton, E. Cox, J. Major, B. McConnell, L. Crookston, B. Mathews.


1. Xi Sigma Pi plants tree — strange! 2. Preservation exhibit — and well-preserved! 3. Big-shot Banqueteers. 4. B. C. Smith's pet display! 5. Wildlife exhibit — see the dead animals! 6. Portion of our forestry second-growth. 7. "Doc's" pride and joy in the Field House. 8. Triumphant ending to Foresters' assembly.

# The Forester's Haven

God made that place so bright and gay,
Every mountain, dell and river,
With sunsets, clouds and wooded slopes—
All from this one great Giver . . . . .
The vast expanse where cattle graze,
The timber where they shelter.
Those lands of which this pen doth speak,
Those forests tall and virgin,
Where streams are cool and crystal clear
Make these thoughts come again . . . . .

II

Summer camp of you I speak tonight,
You must be tired and weary,
Every one has left you there,
I guess its cold and dreary.
The birds, of course have all gone South,
The deer too have come down;
The snow so deep, so pure and still —
A quiet to us unknown!

III

I've traveled over many lands,
And some beyond the sea,
But none are so quiet so wonderful,
As Tony Grove is to me.
To Dean and Doc and all,
Let's tell the other profs so fine and good;
To them we owe it all—
T'was because of them we made the trip,
And stayed until late last Fall.

# Banquet Festival

The fourteenth consecutive Foresters Banquet was held at the college Cafeteria on February 14, in conjunction with the third annual conclave of the Association of Western Forestry Clubs.

Professor Arthur D. Smith, supplied with piquant and humorous stories, was introduced in his role as toastmaster by the club president, Victor Rudolph. Professor Smith called on the visiting guests for interesting and appropriate comments, keeping the entire assemblage in a spirit of revelry throughout the evening.

The guest speaker for the evening was Mr. Henry D. Clepper, Executive Secretary of the Society of American Foresters. In his address, Mr. Clepper treated the subject of the future of employment in the profession of forestry. The talk was not only stimulating and interesting but exceptionally informative, especially to the forester of the future.

During the course of the evening's program the group was enjoyably entertained by songs rendered by Hazel Owens and George Lacey, with Joy Spencer as accompanist. Max Brunker favored the banqueteers with several yodeled numbers.

Forest Service guests attending the banquet included, Messrs. Albert Albertson, Leland Heywood, Joseph Humphrey, Carl B. Arentson, James Stewart, Roy Phillips, George Larson, Alonzo Briggs, A. Dean Phinney, Victor Goodwin, Eamon Nord, Robert Williams, W. F. Murray, Lester E. Moncrief, John N. Kinney and W. L. Robb.

# To The Alumni

PAUL M. DUNN, DEAN

Again greetings to all of you, the 266 alumni of the Utah State Forestry School, from the faculty and the students. Another twelve months have passed and we are about to close another year. Thirty-nine new names were added to the roster last June and about forty more will graduate this year.

The total registration this year indicates that 219 students were enrolled which is a decrease of about 20 percent. Out-of-state students total 97 and 25 states were represented. Again the winter term saw several men enrolled for graduate work; 10 in range and 8 in wildlife. The interest in this worthwhile phase is increasing.

The Summer Camp program, which is vital to the training of our men, is progressing favorably. Special emphasis was placed on fire training last year, and soon after, all the boys had actual experience with a fire within seven miles of the camp. The Forest Service has a new administration building under construction; a four-room office — faculty quarters which will be ready June 1. A new log and wire fence now surrounds the camp area; the baseball players will see the point.

Our faculty is still intact and growing older and better. The Selective Service Act showed up the fine differences in our ages. Three signed up, and Art Smith is now wondering about the advantages of his marital freedom, since his "Uncle" is now a problem.

The forest nursery is still the envy of the other departments on the campus in regard to employment. The output increased last year and no doubt will again this current season.

The employment situation is better. Several appointments have been made this current year, chiefly with the Grazing Service. However, the national defense has been the big boon; border patrol, active service in the army, naval and army air corps, and jobs with the industry are all factors. The Civil Service exams are going through a period of development, as you know, and I am certain that continued improvement will come. The special committee of the Society of American Foresters, Dean Dana of Michigan in charge, is working hard to show the Commission the point of view of the schools and the graduates. Utah State ranked high again last year, especially in the range option. Our range men were above the average in percent passing, particularly with the technical phase; placing thirteen in the first fifty names. This speaks well for the teaching.

The Alumni are supporting their organization in fine shape as evidenced by the turn out at the breakfast last October and the one dollars that are coming in as dues. Utah Foresters are certainly loyal. This reminds me, the S.A.F. will regrade the Forestry schools on the basis of the status in 1940-41. I will soon be asking you for some pertinent information and will count on your continued co-operation. The record of our Alumni was a strong factor in our previous rating, and will be so again.

For your information I am including an employment summary.

| | | | |
|---|---|---|---|
| Forest Service | 59 | Other Federal Services (N.P.S., I.S., Border Patrol, Fish & Wildlife Service, Reclamation Service) | 29 |
| Soil Conservation | 35 | | |
| Grazing Service | 13 | | |
| C.C.C. | 22 | A.A.A. | 9 |
| Teaching, schools and colleges | 14 | Graduate Study | 18 |

| | | | |
|---|---|---|---|
| State Departments | 11 | L.D.S. missions | 2 |
| U. S. Army and Marine Corps | 12 | Deceased | 3 |
| | | Private work | 42 |
| | | Total | 269 |

Well, I will close for this time as you will be hearing from me again. Write me when you have time and keep us informed as to your whereabouts and family increases. Best regards and sincere wishes from the Utah State Forestry Faculty to all of you for a most successful year.

## "Ye Olde Clubbe"

(Continued from Page 31)

The Home Economics girls were special guests at a club meeting during which even the most backward forester had an opportunity to prove that he was a gentleman.

During Foresters' Week, the club was host to the Third Annual Conclave of the Association of Western Forestry Clubs, at which delegates from ten western forestry schools gathered to exchange club ideas and formulate plans for affiliation of college forestry clubs with the Society of American Foresters. Special guest at the conclave was Henry E. Clepper, executive secretary of the Society. The climax of the week was reached at Paul's Party, which was attended by Paul Bunyan and Babe, his Blue Ox, and all other true Foresters. The final event of the week's activities was a steak feed at Summer Camp given for the conclave delegates by the fraternity of Xi Sigma Pi.

Not content with having had a Week of their own, the Foresters assisted (?) the Engineers in the promotion of Engineers' Week, with the result that there was more friendly rivalry during that week than during any previous Engineers' Week.

In campus intramural sports, the Foresters have done themselves proud for the second consecutive year. Under the capable leadership of Rex Hampton, they now have a substantial lead in the department league, and bid fair to carry off the intramural trophy at the end of the year.

With the school year drawing to a close, two events remain on the calendar of club activities. The first is the Moonlight Hike to the "Utah Juniper," the gnarled old patriarch and emblem of the club. This year the club was officially made guardian of the tree by the Forest Service.

The other event is the annual Spring Party to be held at the Boy Scout camp. Games, hiking, a big feed, dancing and a full moon will be featured on the program. It is also the occasion at which the newly elected officers take over their duties for the ensuing year.

And so we close another chapter in the activities of the Utah Foresters. The cooperation of all of the fellows has been commendable. They have filled the trophy case to capacity; they have demonstrated themselves as leaders of campus activities, and to them, we, the outgoing officers, sincerely say, "Many thanks." To the new officers who are to take over the reins of the club at the Spring Party, we heartily wish a year of as pleasant and worthwhile activities as ours has been, and, a year from now, may they look back over the year with as much pleasure as we do at this time.

# Senior Pedigrees

**ROY BEAN**
**Wildlife Management**
Summer '37 Forest Service
Summer '38, '39 Grazing Service
'40 Wildlife Research Unit
Alpha Zeta
Utah Foresters

**JOHN BERNHARD**
**Forest Management**
Summer '40 Forest Service
Xi Sigma Pi, Secretary-Fiscal agent; Editor, "Utah Juniper," Sigma Nu, Utah Foresters.

**ELMER BOYLE**
**Range Management**
Summer '40 Forest Service
Forestry Club
Weber Club

**JOHN BURT**
**Forest Management**
Summers '37, '38, '39, '40, Forest Service

**ROBERT CAREY**
**Forest Management**
Summer '40 Forest Service
Intramural Manager '39-'40, Badminton Club
Utah Foresters

**LAWRENCE J. COLTON**
**Forest Management**
Summer '32, '33, '40 Forest Service
Utah Foresters

**MAX S. CORAY**
**Range Management**
Summer '38, Forest Service
Utah Foresters

**LORIN DEDRICKSON**
**Wildlife Management**
'39 Part time Assistant Wildlife Research Unit
Xi Sigma Pi, Phi Kappa Phi, Rifle team Captain

**DELBERT GABARDI**
**Forest Management**
Utah Foresters

**MARSHALL GAUFIN**
**Wildlife Management**
Summer '37, Forest Service
'38, '39, '40, Wildlife Research Unit
Phi Gamma Rho

**ROBERT GOODING**
**Forest Management**
Summer '38, '39, Forest Service
Football, R.O.T.C.

**HARRY GRACE**
**Forest Management**
Summer '34, '35, '36, '37, '39, Forest Service
Xi Sigma Pi

**LISLE GREEN**
**Range Management**
Range Survey Utah Exp. Station '40
Summer '41, Grazing Service
Utah Foresters

**BURL W. HERMANSEN**
**Range Management**
Summer '37, A.A.A.
Wrestling '39, '40,
Utah Foresters, R.O.T.C.

**HAROLD L. HINER**
**Range Management**
Summer '38, Rich County Range Survey, Summers '39, '40, Co-Range Examiner A.A.A.
President of Student Body '40-'41, President A.W.F.C. '40-'41, President Utah Foresters '39-'40, Xi Sigma Pi,
Blue Key, Phi Kappa Phi Alpha Zeta, Sigma Nu, R.O.T.C., Scabbard and Blade, Rifle Team

**PAUL HOWARD**
**Range Management**
Summer '40, '41, Forest Service
Alpha Zeta, Utah Foresters

**BUEL HUNT**
**Forest Management**
U. S. Forest Service '32 to '40
Utah Foresters

**PAUL M. JENKINS**
**Range Management**
Lambda Chi, Utah Foresters

**NED L. JENSEN**
**Forest Management**
Summer '37, Student Assistant C.C.C.
Summer '39, Summer Camp employee
Summer '40, Forest Service
Utah Foresters

**JAMES KING**
**Forest Management**
Summer '40 Soil Conservation Service
U.S.A.C. Nursery co-foreman '40
Utah Foresters

**RHINEHART KOWALLIS**
**Wildlife Management**
C.C.C. '35
Summer '40, '41 Forest Service

**E. GLEASON KRUSE**
**Forest Management**
C.C.C. '35, Rocky Mountain Exp. Station '37, '38, '39
Utah Foresters

**ROBERT LASSEN**
**Wildlife Management**
Creel Census '40
Utah Foresters, Weber Club

**DAVID LATIMER**
**Wildlife Management**
Club Council, Intramurals, Dramatics

**NATHAN LIPMAN**
**Wildlife Management**
Alpha Zeta, Utah Foresters

**JACK MAJOR**
**Range Management**
Summer '38 Range Dept. Herbarium
Summer '39 Forest Service
Summer '40 Range Survey Utah Experiment Station
Phi Kappa Phi, Phi Gamma Rho

**CLARENCE R. MELDRUM**
**Range Management**
Soil Conservation Service, Forest Service
Delta Phi, I.S.A., Utah Foresters

**ED MILLARD**
**Wildlife Management**
Summer '39, '40 Forest Service Track

**ALBERT MITCHELL**
**Forest Management**
Summer '39, Spring '41 Nursery Foreman
Summer '40 Forest Service
Alpha Zeta, Utah Foresters

**WILLIAM MURRAY**
**Range Management**
Summer '40 Forest Service
Alpha Zeta, Utah Foresters
Weber Club

**RAY W. PERKINS**
**Range Management**
Utah Foresters

**FRED L. PHILLIPS**
**Forest Management**
'28 to '40 U. S. Forest Service

**SIDNEY RALPH**
**Forest Management**
Summer '38, '39, '40 A.A.A.
Sigma Nu

**LLOYD R. RAMELLI**
**Wildlife Management**
U. S. Fish and Wildlife Service '37, '39, '40
Utah Juniper Staff '40, Utah Foresters
Associate Editor, Utah Juniper" '41

**VICTOR J. RUDOLPH**
**Forest Management**
Summer '37, '38, '39, '40 Forest Service, Clarke-McNary forest nursery office work '40 and '41
President Utah Foresters '40-'41, Business Manager Juniper '39-'40, Co-manager Home and Harvest Festival '40,
Xi Sigma Pi, Alpha Zeta

**HENRY SKIDMORE**
**Range Management**
Desert Range Experiment Station '36
Summer '40 Forest Service
Utah Foresters

**B. C. SMITH**
**Range Management**
Summer '40 Soil Conservation Service
I.S.A., Utah Juniper staff photographer '40, '41
Utah Foresters

**D. V. SPEAKMAN**
**Range Management**
Summer '39, '40 Forest Service
Utah Foresters

**ANDRE TRUDEN**
**Range Management**
Forest Service
Lambda Chi, Utah Foresters, R.O.T.C.

**JOHN P. TUCKER**
**Forest Management**
Summer '40 Forest Service
Xi Sigma Pi, Vice-President, Phi Kappa Phi, Utah Foresters

**NOLAN WEST**
**Wildlife Management**
Summer '37, '38 Forest Service '39 Biological Survey, '39, '40, '41 Utah Fish & Game Dept.
Xi Sigma Pi,
Alpha Zeta, Utah Foresters

**JOHN WIKSTROM**
**Forest Management**
Summer Camp employee '40,
Summer '40 Forest Service
Utah Foresters

**NEIL G. WILCOX**
**Range Management**
Intermountain Forest and Range Experiment Station '37, '38, '39
Summer '40 A. A. A.
Utah Foresters, Beta Kappa, R.O.T.C., Rifle Team

**HARRY R. WOODWARD**
**Forest Management**
Summer '38 Yellowstone Nat. Park
Summer '40 Forest Service
Phi Kappa Phi, Sigma Nu

# Alumni Directory

FAUSETT, ADELBERT, '30—U. S. Forest Service, 760 Market St., San Francisco.
HANSEN, J. DELOY, '30—U. S. Forest Service, Logan, Utah.
BENTLEY, VALENTINE, '31—U. S. Reclamation Service, Provo, Utah
CLIFF, E. P., '31—U. S. Forest Service, Grants Pass, Oregon.
HANSEN, W. L. '31—U. S. Forest Service, Boise, Idaho.
STARR, C. P., '31—Soil Conservation Service, Price, Utah
SWENSON, MARRINER, '31—Cal. Forest and Range Experiment Station, Berkeley, California.
DESPAIN, OWEN, '32—U. S. Forest Service, Moab, Utah
EARL, D. M.,'32—U. S. Forest Service, Carlsbad, New Mexico.
JACOBS, J. L., '32—U. S. Forest Service, Idaho Falls, Idaho.
JULANDER, ODELL, '32—Forestry Dept. Iowa State Col. Ames, Iowa.
SCHOTT, J. D., '32—Soil Conservation Service, Morgan, Utah.
STEED, ALVIN, '32—Soil Conservation Service, Albuquerque, N. M.
ASTLE, WALTER, '33—U. S. Forest Service, Escalante. Utah.
FONNESBECK, FANK O., '33—National Park Service, C.C.C., Provo, Utah.
JOHNSON, WALLACE M., '33—Rocky Mt. For. & Range Exp. Sta. Woodland Park, Colorado.
MICHAELS, C. C., '33—Soil Conservation Service, Silver City, New Mexico.
THORNOCK, CLARENCE, '33—U. S. Forest Service, Dubois, Wyoming.
ANDERSON, R. C., '34—U. S. Forest Service, Ogden, Utah.
CARLSON, LELAND H., '34—U. S. Forest Service, Manila, Utah.
SILL, MILTON, '34—U. S. Forest Service, Atlanta, Idaho.
VAN BUREN, GORDON, '34—U. S. Forest Service, Yampa, Colorado
BEAN, RUSSELL, '35—Lumber Co., Las Vegas. Nevada.
CRANE, B. K., '35—U.S. Forest Service, Potts. Nevada.
CROWL, J. M., '35—U. S. Forest Service Licking, Missouri.
GUNDERSON, ARDEN, '35—U. S. Forest Service, Bozeman, Montana.
HANSON, WALTER O., '35—U. S. Forest Service, Pitkin, Colorado.
LARSEN, FLOYD, '35—Soil Conservation Service, Billings, Montana.
LARSEN, WAINE, '35—Grazing Service, 503 Federal Bldg. Salt Lake.
McCONKIE, ANDREW, '35—U. S. Forest Service, Forney, Idaho.
OLSEN, LeGRAND, '35—U. S. Forest Service, Mayhill, New Mexico.
REDD, JOHN, '35—Soil Conservation Service, Grand Junction, Colorado.
STOCK, M. R.,' 35—U. S. Forest Service, Ennis, Montana.
ALLEN, FLOYD, '36—Deceased.
ANDREWS, HORACE, '36—Soil Conservation Service, Las Cruces, New Mexico.
BAUGH, FRED R., '36—Coast Artillery Corps, U. S. Army, San Diego, California.
BREWER, A. N., '36—U. S. Forest Service, Logan, Utah.
CLARK. LEWIS, '36—U. S. Forest Service, Salt Lake City, Utah.
COUCH, JOE.,'36—CCC Educational Adviser, Riggins, Idaho.
ENGLAND, ED., '36—CCC Educational Adviser, Cherry Creek, Nev.
ERICKSSON, CARL., '36—Deceased.
FINLINSON, RICH. '36—CCC Foreman, Huntsville, Utah.
FLOYD, J. W., '36—Assistant Professor of Forestry. U.S.A.C. Logan. Ut.
GROSSENBACH, PAUL, '36—U. S. Forest Service, Boise. Idaho.
HULL, ALVIN C.,'36—Intermountain Forestry and Range Experiment Station, Ogden, Utah.
JONES, J. P., '36—N. Am. Aviation Co., Inglewood, California.
JONES, MARK, '36—CCC Educational Adviser, Las Vegas, Nevada.
MANNING. WALLACE, '36—Quarter Master Corps. U. S. Army, Ft. Warren, Cheyenne, Wyoming.
McDERMAID, FERRIS, '36—U. S. Forest Service. Glorieta, New Mex.
RAMPTON, LEONARD, '36—U. S. Forest Service. Prineville. Oregon.
ROHWER. LAMONT, '36—Grazing Service. Bishop. California.
SMITH, ARTHUR D., '36—Assistant Professor of Range Management, U. S. A. C., Logan, Utah.
SNYDER, NATHAN, '36—U. S. Forest Service, El Rito, New Mexico.
STOKES, VICTOR. '36—U.S. Forest Service, Pleasant Grove, Utah.
SWAINSTON, GEORGE D., '36—Soil Conservation Service, Salt Lake City, Utah.
SWENSON, MONT, '36—Soil Conservation Service, Malad, Idaho.

TAGGART, JOHN, '36—Route No. 3, Ogden, Utah.
TOWNSEND, WILLIAM, '36—CCC Educational Adviser, San Bernardino California.
TUCKER, BERT, '36—CCC Educational Adviser, Mackay, Idaho.
WOODS, LOWELL G., '36—U. S. Forest Service, Afton, Wyoming.
ALLEN, LELAND, '37—Grazing Service, Albuquerque, New Mexico.
ALLEN, WAYNE, '37—U. S. Forest Service, San Bernardino, California.
ASTLE, LLOYD, '37—National Park Service, Yellowstone Park, Wyo.
BERG, JACOB, '37—U.S. Forest Service, CCC, Missoula, Montana.
BRIDGE, MAX, '37—Grazing Service Lander, Wyoming.
DAY, VANCE, '37—Soil Conservation Service, Tuba City, Arizona.
DORIUS, FLOYD, '37—Soil Conservation Service, Weiser, Idaho.
DRUMMOND, DON, '37—Instructor of Forestry, Russellville, Arkansas.
DRUMMOND, JOHN, '37—Indian Service, White River, Arizona.
GENAUX, THERON, '37—CCC Educational Adviser, Moab, Utah.
GIERISCH, RALPH, '37—U. S. Forest Service, Buena Vista, Colorado.
GRAY, ANDERSON M., '37—Soil Conservation Service, Marfa, Texas.
GRINER, LEE, '37—Soil Conservation Service, Mandan, North Dakota.
HANSEN, MARVIN O., '37—A.A.A. Farm Inspector, Salt Lake City, Ut.
HANSEN, SHERMAN, '37—Teacher Wilson School, Logan, Utah.
HARDY, CLARK, '37—CCC Foreman, Grazing Service, Salt Lake, Ut.
HATCH, BRADFORD, '37—Teacher, Salt Lake City, Utah.
HENDERSON, ERNEST, '37—Soil Conservation Service, Goldendale, Washington.
HERMANSEN, ROYCE, '37—Soil Conservation Service, Caliente, Nev.
HIRST, WILLIAM H., '37—Grazing Service, Salt Lake City, Utah.
HOLT, ARTHUR E., '37—C.A.C. U. S. Army, Willets, California.
JENSON, MAX S., '37—Soil Conservation Service, Fort Sumner, New Mexico.
JORGENSEN, ELDORES S., '37—Fish and Wildlife Service, Boise, Ida.
KANE, JOHN F., '37—222 W. Ave., East Rochester, N. Y.
KETCHIE, HENRY L., '37—Intermountain For. & Range Exp. Sta., Ogden, Utah.
KLOMP, GERARD J., '37—Soil Conservation Service, Buffalo, Wyo.
LAVIN, FRED, '37—U. S. Forest Service, Del Norte, Colorado.
LOW CLYDE, '37—Soil Conservation Service, Price, Utah.
LOW JESSOP, '37—Graduate Fellowship, Iowa State Col., Ames, Iowa.
LUND, DOYLE S., '37—Soil Conservation Service, Cedar City, Utah.
MADSEN, CLYDE, '37—Fish and Wildlife Service, Elko, Nevada.
McCRACKEN, E. J., '37—Susquehanna Flood Control, Binghampton, New York.
MOLLINET, LEO, '37—22 South 2nd West, Brigham City, Utah.
MORSE, BLAINE C., '37—Soil Conservation Service, Price, Utah.
OVIATT, CLIFFORD W., '37—U.S. Forest Service, Baldwin, Michigan.
OWEN, NEIL W., '37—CCC Educational Adviser, Moab, Utah.
PASSEY, HOWARD B., '37—Soil Conservation Service, Rodeo, New Mexico.
PASSEY, SCOTT B., '37—Soil Conservation Service, Mount Pleasant, Utah.
REVEAL, JACK L., '37—Soil Conservation Service, Yerington, Nevada.
RICH, VERNON, '37—Fish & Game Department, Malad, Idaho.
SEVY, JAY L., '37—U. S. Forest Service, Austin, Nevada.
SHEPHERD, WELDON O., '37—Graduate Assistant, Uni. of Neb., Lincoln, Nebraska.
SNYDER, EMERY, '37—CCC Foreman, Grazing Service, Milford, Ut.
TRIBE, WAYNE, '37—U. S. Army
WADSWORTH, DOUGLAS, '37—U. S. Forest Service, Hanna, Utah.
WARNER, SYLVAN D., '37—Boy Scouts of America, El Reno, Okla.
WATSON, ELDEN M., '37—Soil Conservation Service, Monfort, Wis.
WILKINSON, KARL J., '37—Deceased
WINKEL, A. G., '37—Soil Conservation Service, Pendleton, Oregon.
WOOD, EVERETT C., '37—Farming. Sterling, Idaho.
WRIGHT, MILTON, '37—CCC Superintendent, U.S.F.S., Gunnison, Col.
WYCOFF, HAROLD M., '37—U. S. Forest Service, Ogden, Utah.
ALLRED, GLADE, '38—A.A.A. Farm Supervisor, Logan, Utah.
ALLRED, WARREN, '38—Wyoming Fish and Game Department, Cheyenne, Wyoming.
ANHDER, THEO E., '38—Hyrum, Utah.
ANDREWS, NORMAN, '38—U. S. Forest Service, Nevada City, Calif.

ARMSTRONG, HERBERT, '38—Coast Artillery, U. S. Army, Hawaiian Islands.
BELL, SHELDON, '38—Farm Agent, Indian Service, Window Rock, Ariz.
BLAIR, RAY, '38—CCC Foreman, Grazing Service, Mountain Home, Idaho.
BLASER, HERMAN E., '38—U. S. Grazing Service, Albuquerque, New Mexico.
BUNDERSON, VICTOR L., '38—Soil Conservation Service, Fabens, Tex.
CLIFF, OLIVER, '38—U. S. Forest Service, Pocatello, Idaho.
DALE, STERLE, '38—U. S. Forest Service, Jackson, Wyoming.
DARGAN, LUCAS, '38—Fish and Wildlife Service, Bowie, Maryland.
DeMOISY, RALPH, '38—U. S. Army, San Francisco, California.
DOMAN, EVERETT, '38—Wildlife Research Unit, Logan, Utah.
DOWNS, ELVIN, '38—Vocational Ag. Instructor, Afton, Wyoming.
DROWN, EUGENE A., '38—Nat. Parks Service, Yosemite Park, Calif.
EGAN, GILBERT, '38—966 Wash-Ave., Ogden, Utah.
ELLISON, DON J., '38—Forestry Engineer, Fredonia, Arizona.
ELLISON, PHAY, '38—Salesman, Hollydale, California.
FULLER, REVILO, '38—Timekeeper, El Segundo, California.
GESSEL, HOMER, '38—Landscape Gardner, Providence, Utah.
HALES, DOYLE C., '38—Soil Conservation Service, Moab, Utah.
HARRIS, FRED B., '38—Grazing Service, University of Nev., Reno.
HARRIS,, RICHARD C., '38—A.A.A. State Range Examiner, Logan, Utah.
HAYES, WILLIAM S., '38—Idaho Fish & Game Dept., Pocatello, Idaho.
HEYWOOD, BENJAMIN, '38—Soil Conservation Service, Santa Fe, New Mexico.
HINCHCLIFF, HOWARD, '38—Teacher, 2680 Adams Ave., Ogden, Utah.
HOLLADAY, CLIFTON, '38—Salesman, Salt Lake City, Utah.
HULL, ROY, '38—A.A.A| County Supervisor, Logan, Utah.
HURST, WILLIAM D., '38—U. S. Forest Service, Salt Lake City, Utah.
JENSEN, CYRIL D., '38—Grazing Service, Worland. Wyoming.
JEPPSON, EARL F., '38—Teacher, Howell, Utah.
JOHNSON, GEORGE, '38—543 S. 1st E., Brigham City.
JOHNSON, MORRIS A., '38—1315 Wash. Blvd., Ogden, Utah.
JONES, DOUGLAS, '38—A.A.A. Range Inspector, Nephi, Utah.
LEWIS, MORRIS W., '38—U. S. Forest Service, Ely, Nevada.
LUND, CLAIR, '38—647-23 St. Ogden, Utah.
MATHEWS, LAWRENCE W., '38—CCC Educational Adviser, Clover, Utah.
McBRIDE, RAY, '38—Fish and Wildlife Service, Three Creeks, Idaho.
MIR, JOSEPH, '38—Washington, D. C.
NELSON, RALPH, '38—Graduate Student, Uni. of Idaho, Moscow, Ida.
NELSON, MARCUS, '38—Project Leader, Fish & Game Department, Logan, Utah.
NOBLE, MYRVIN, '38—Grazing Service, Salt Lake City, Utah.
OWENS, RHODELL, E.,'38—Graduate Ass't. State Col. of Forestry, Syracuse, New York.
PARRY, CONWAY, '38—CCC Foreman, Green River, Utah.
PETERSON, VIRGIL, '38—U. S. Army, Portland, Oregon.
PIERLE, CHARLES, '38—West Va. Conservation Comm., Charleston, West Virginia.
RICHMAN, VAL, '38—Border Patrol Inspector, Pecos, Texas.
ROBERTS, RAYMOND, '38—566-29th St., Ogden, Utah.
ROBINSON, GRAYDON, '38—Soil Conservation Service, Malta, Mont.
ROYLANCE, FINLEY W., '38—Springville, Utah.
ROYLANCE, RICHARD, '38—U. S. Bureau of Census, Washington, D.C.
SCHOLES, HAROLD B., '38—CCC Educational Adviser, Park Valley Utah.
SHIPLEY, MARK, '38—Nevada Experiment Station, Reno, Nevada.
SHIPLEY, ROY, '38—Soil Conservation Service, Price, Utah.
SPEAR AARON G., '38—U. S. Indian Service, Window Rock, Ariz.
SURFACE, VICTOR, '38—Soil Conservation Service, Tooele, Utah.
THOMSON, REED, '38—U.S. Forest Service, Baker, Nevada.
WEBB, DAYL, '38—Bureau of Reclamation, Kamas, Utah.
ANDERSON, WILLIAM N., '39—Grazing Service, Pocatello, Idaho.
BAKER, HAROLD, '39—Graduate Assistant, University of California, Berkeley, California.
BAKER, LYLE, '39—Graduate Assistant, Oregon State, Corvallis, Ore.
BARNEY, MARVIN, '39—Ferron, Utah.

BLAISDELL, J. P., '39—Graduate Assistant, University of Idaho, Moscow, Idaho.
BROWN, SCOTT, '39—U. S. Forest Service, Sandy, Utah.
CARLSON, MERRILL, '39—Utah Road Commission, Ogden, Utah.
CHRISTENSEN, RANGWELL, '39—U. S. Indian Service, Wanblee, South Dakota.
COOPER, HAROLD, '39—Soil Conservation Service, Worland, Wyo.
DAVIS, DON, '39—U. S. Forest Service, Pocatello, Idaho.
DECKER, REX, '39—Engineering Dept., Ogden, Utah.
ELLIS, STEPHEN B., '39—Border Patrol Inspector, Alpine, Texas.
FARR, JEDD, '39—2852 Delevan Drive, Los Angeles, California.
FOULGER, HOWARD, '39—U. S. Flood Control Survey, Richfield, Ut.
GESSEL, STANLEY P., '39—Graduate Ass't, University of California, Berkeley, California
GRANDY, DeWITT, '39—A.A.A Range Examiner, Logan, Utah.
GUNTHER, LLOYD F., '39—L.D.S. Mission, Lehi, Utah.
GURR, BOYD, '39—CCC Foreman, St. George, Utah.
HANDY, HARLEY, '39—Grazing Service, Brigham City, Utah.
HANSON, ROBERT, '39—Forest Service, Swartout, California.
HARRIS, GRANT, '39—Northern Rock Mountain Forestry Experiment Station, Miles City, Montana.
HARRIS, PAUL, '39—CCC Educational Adviser, Burns, Oregon.
HAWKES, EUGENE, '39—L. D. S. Mission, Hawaii.
HOBSON, DEAN, '39—CCC Foreman, Park Valley, Utah.
JOHNSON, HAROLD D., '39—Victor, Idaho.
JONES, GLEN, '39—Border Patrol Inspector, East Vaughn, New Mex.
JORGENSEN, JACK, '39—Hyrum, Utah.
KITTAMS, WALTER, '39—Graduate Assistant, University of Maine, Orono, Maine.
KRUEGER, WILLIAM, '39—Utah Copper Co., Bingham Canyon, Utah.
MASON, LAMAR, '39—Grazing Service, Salt Lake City, Utah.
McDONALD, JOHN, '39—U.S. Forest Service, Monticello, Utah.
MORRISON, JOHN, '39—National Park Service, Glacier, Park, Mont.
ONSTOTT, OSCAR, '39—Kendrick, Idaho.
PETERS, EDWARD, '39 A.A.A. County Supervisor, Liberty, N. Y.
PLAYER, GARNETT, '39—New York Life Ins. Co., Murray, Utah.
QUIGLEY, L. GLEN, '39—Forest Service, Salt Lake City, Utah.
RABB, JOE, '39—N. C. Conservation Department, Elizabeth, North C.
RATTLE, PAUL S., '39—Lockheed Aircraft Corp., Pasadena, Calif.
RHOTON ROYAL, '39—U. S. Forest Service, Pinetop, Arizona.
RICH, HARVEY N., '39—Utah Dept. of Public Welfare, Ogden, Utah.
ROBINSON, REED, '39—Border Patrol Inspector, Tubac, Arizona.
ROMERO, FORREST, '39—CCC F-408, Preston, Idaho.
ROUNDY, ACIL, '39—A.A.A. Range Inspector, Provo, Utah.
SCHMUTZ, ERVIN, '39—Graduate student, U.S.A.C., Logan, Utah.
SHAFER, PAUL S., '39—Grazing Service, Blanding, Utah.
SHEPHERD, ERSCHEL, '39—Instructor National Defense, U.S.A.C., Logan, Utah.
SMITH, GILBERT, '39—Graduate Student, U.S.A.C., Logan, Utah.
SORENSON, LEON, '39—U. S. Census Bureau, Washington, D. C.
SPENDLOVE, EARL, '39—Grazing Service, Salt Lake City, Utah.
SPIERS, DONALD, '39—Lava Hot Springs, Idaho.
SPILSBURY, BERKELEY, '39—Railway Express Co., Ogden, Utah.
TAYLOR, THOMAS, '39—Graduate Student, U.S.A.C., Logan, Utah.
THOMAS, JULIAN R., '39—U. S. Forest Service, Logan, Utah.
TURNER, DUANE, '39—International Smelting Co., Tooele, Utah.
VANCE, HERBERT, '39—Forest Service, Couer, D'Alene, Idaho.
WADSWORTH, JAMES D., '39—CCC Educational Adviser, Springdale, Utah.
WHITAKER, SPENCER, '39—Border Patrol Inspector, Laredo, Texas.
GRINER, LYNN, '39—Arizona Conservation Department, Tucson Ariz.
HANSON, WALLACE R., '39—Vocational Teacher, Brooke, Alberta, Canada.
ANDERSON, RAY W., '40—Grazing Service, Salt Lake City, Utah.
ANDREWS, LLOYD NELSON, '40—Teacher, Jr. High school, Logan, Utah.
ASHCRAFT, H. WAYNE, '40—U. S. Bureau of Census, Washington, D. C.
AUSTIN, LAURENCE R., '40—U. S. Bureau of Census, Washington, D.C.
BISHOP, MERLIN, '40—Forest Service, Cedar City, Utah.

BOWER, KENNETH G., '40—Forest Service, Swartout, California.
BRINGHURST, JOHN FRANK, '40—U. S. Bureau of Census, Washington, D. C.
CALL, GARLAND D., '40—Stoddard Lumber Co., Mack's Inn, Idaho.
CHATELAIN, EDWARD F., '40—Graduate Assistant, Oregon State, Corvallis, Oregon.
CLINKINBEARD, MAX B., '40—U. S. Marine Corps, San Diego, Calif.
COOPER, TALMAGE, D., '40—Army Air Corps, Moffat Field, California.
CURTIS, CLYDE, A., '40—123 W. 1st N., Logan, Utah.
DAVIS, LAWRENCE C., '40—U. S. Census Bureau, Washington, D. C.
HAMPTON, JOHN WM., '40—Hartford Insurance Co., Morton Grove, Illinois.
HENDERSON, FLOYD A., '40—National Park Service, Belton, Mont.
HINTON, CLEMONS, '40—Army Air Corps, Santa Maria, California.
JANSON, REUEL G., '40—Graduate Assistant, U.S.A.C., Logan, Utah.
JOHNSON, CARL MAURICE, '40—U. S. Marine Corps, Quantico, Va.
KILLPACK, ELLIOTT R., '40—A. A. A. Range Examiner, Cedar City, Ut.
LADLE, ORVEL HUNT, '40—Forest Service, Santa Barbara, California.
MADSEN, VAUGHN D., '40—Graduate Assistant, U.S.A.C., Logan, Ut.
MARSTON, RICHARD B., '40—Intermountain Forestry & Range Exp. Station, Ogden, Utah.
MERRILL SPENCER, '40—Lab. Asst. Int. Smelting Co., Tooele, Utah.
MITCHELL, YALE, '40—Forest Service, Boise, Idaho.
NELSON, NOLAND, F., '40—U. S. Census Bureau, Washington, D. C.
OKESON, KENNETH W., '40—MT. States Telephone Co., Holladay, Ut.
OLSEN, REID PORTER, '40—Forest Service, Logan, Utah.
PALMER, MARCEL, '40—A. A. A. Range Examiner, Randolph, Utah.
PHILLIPS, THOMAS A., '40—Grazing Service, Salt Lake City, Utah.
REES, P. MAX., '40—Soil Conservation Service, Pleasanton, Texas.
ROBINSON, B. FRANKLIN, '40—U. S. Census Bureau, Washington, D.C.
ROBINSON, MAX EDWARD, '40—Graduate Assistant, Oregon State, Corvallis, Oregon.
SCHERBEL, PAUL, '40—Rocky Mt. Forest & Range Experiment Station, Ft. Collins, Colorado.
SEVY, THOMAS H., '40—Forest Service, Cedar City, Utah.
SMITH, ELDON H., '40—Fish and Wildlife Service, Fillmore, Utah.
SNAPP, NATHAN J.,'40—U. S. Census Bureau, Washington, D. C.
SPEIRS, HAROLD K., '40—Grazing Service, Salt Lake City, Utah.
TODD, W. FRANTZEN, '40—Army Air Corps, Mather Field, Mills, California.
UDY, JAY R., '40—Graduate Student, U.S.A.C., Logan, Utah.